Teaching Research on Building Equipment Facing the Engineering Management Specialty

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Abstract. Talent training of Engineering Management Specialty in Colleges and universities is received professional training engineers, with some related project management of economy, management and legal knowledge of high-quality personnel. Containing building water supply and drainage engineering, Building Equipment is one of important professional basic courses. The master degree of students in the course would be help to the follow-up professional courses. In the actual teaching process, there are many problems, such as the selection of teaching materials, the lack of practical links, the lack of attention to students, the lack of motivation and mechanism for self growth and so on. This paper will be explore new method for engineering undergraduate teaching from such four aspects as selecting the appropriate teaching content for Building Equipment, strengthening practice links, guiding the students from "want me to learn" to "I want to learn" and change, strengthen teachers self training to promote teaching self growth to of scientific research.

Introduction

Engineering management is the integration management of a specific technology, and all kinds of construction projects can become the object of project management. For engineering managers, as these construction projects involve a wide range of engineering fields, the technical knowledge related to engineering has the characteristics of diversity and complexity.

The professional personnel training is adapt to the characteristics of engineering management in Colleges and universities. on one hand, he goal is to train engineers who have received professional training, a solid technical foundation for civil engineering, practical ability. and on the other hand , the goal is to train high quality talents who have certain economic and management knowledge related. Therefore, the basic characteristics of these talents above are understanding of technology and good at management. The study and mastery of engineering and technical knowledge become the key for these talents to successfully manage and control the whole process of construction projects.

Building Equipment is an engineering technology basic course for engineering management specialty. The students' mastery of the course content has great influence on subsequent professional courses. In actual teaching, some problems should be faced with, such as lack of specific related materials for management engineering students, lack of practice links, lack of enthusiasm for learning students and so on, which would affect the absorption of the course knowledge of the students.
The Main Teaching Contents of Building Equipment

![Diagram of teaching contents]

Figure 1. The main teaching contents of Building Equipment.

Teaching Difficulties in Water Supply and Drainage Engineering of Building Equipment

Selection of Teaching is Difficult

Now, the textbooks used of undergraduate teaching materials are mainly oriented students who are major in civil engineering and architecture. It is difficult to find textbooks written for Engineering Management Majors. Therefore, according to the training target of engineering management named "deep foundation and broad extension", it is very important to select the corresponding teaching materials.

Lack of Practical Links

The content of Building Equipment is abstract for undergraduate students. These students will feel much difficult in the latter stage of theoretical learning without going through the preliminary cognition practice and perceptual knowledge. However, in practice, the training time is usually only one week, and mainly based on the civil engineering technology. From the time and content arrangement, the students’ related practice of building equipment is not enough.

Much more attention often has been paid to civil engineering technology which has been thought as the only important technical support of construction management based on the traditional concept. Professional equipment engineering technology has been ignored. Therefore, another important content of practice links, namely the curriculum design, is generally not arranged, which is easy to cause the "theory learning" and the "practice doing" of students are not linked together.

Students do not Pay Much Attention to It

This course construction equipment is often set as elective courses. Although students know the importance of the course and elect it by word of mouth, it is difficult for them to give enough attention in the mind. This situation leads the students to lack of motivation in learning of the course facing with difficulties, which would influence the master degree of the course.

Teachers Lacking the Power and Mechanism of Self Growth

Construction management professional teachers need to have knowledge background of engineering, management, economy, law and information. Therefore, it is necessary for teachers to
learn and integrate constantly the knowledge in different fields. therefore, the process of teaching is also the process of self learning.

In the universities and colleges, a kind of evaluation system to teachers are now popular. in this system, the proportion evaluation in scientific research are often larger than in teaching. teachers therefore often ignore the teaching research, and will invest more time and effort on the research paper writing and research projects applying.

Teaching Focus in Water Supply and Drainage Engineering of Building Equipment

Selecting Suitable Teaching Content for Engineering Management Specialty

It is difficult to find special teaching textbooks for engineering management majors. Therefore, teachers need to select teaching materials according to the training target of "deep foundation and broad extension" of Engineering Management.

First of all, in building water supply and drainage, for example, because of the knowledge involved in a wide range of less, therefore, teaching contents should be selected according to different professional background of students to ensure the effectiveness of knowledge. the mathematical foundation of Students majoring in engineering management is poor, and at the same time too deep theoretical basis of water supply and drainage is not needed. so teachers do not tangle in theory in class. For example, when teaching the Bernoulli equation theory, teachers could only explain its application combined with the typical case, so as help students to understand the basic concepts of velocity head, head position. in this way, simple hydraulic calculation can be done by using the equation.

Secondly, in the teaching process of construction equipment, teachers should combined with the status of development of the industry , add new knowledge in time, increase the standard content, especially the code for construction and acceptance of building equipment according to the teaching guidance committee requirements.

Thirdly, according to the situation of curriculum convergence in our school, teachers should increase the transition link of theory to practice, and reduce the students' practice adaptation period. As for the professional students of the engineering management, construction equipment are the foundation of following professional course, namely the cost of general building services works cost and the cost of municipal engineering. Therefore, teachers should arrange special time for the transition from system chart to construction drawings in teaching.

Strengthen the Content of Practice

After the theoretical teaching of engineering technology courses, teachers arrange curriculum design and train students' practical ability, which is one of the important ways to improve students' ability of integrating theory with practice in Engineering Majors. Since the nature of building equipment has been set up as an elective course, the curriculum design has not been arranged in many universities due to the limitation of total teaching hours and other reasons. From the point of view of system teaching, this link needs to be managed. The content of curriculum design training can be divided into several small cases, which are placed after the theoretical teaching of each chapter, and the students are required to complete them in the form of big assignments. In this way, by the form of "doing by learning & learning by doing" formed, students' practical ability can be better trained, as well as under the premise that curriculum design has not been arranged.

Secondly, the link between the content of this course and other practices is helpful to train students' systematic view of large engineering. Before the theory learning of building equipment, students will generally do cognitive practice. However, the content of construction equipment involved in internship is not enough, and there is also a certain interval time between practice and theoretical study. Therefore, in classroom learning, students need to be arranged to do "practice" outside the classroom. For example, in teaching the building drainage system, students can be taken to a nearby school building, or a bathroom in student dormitory, to observe drainage pipes, roof water tanks and so on. In this way, the practice link and classroom theory are closely related, and
the principles of abstract drainage pipe layout are embodied and visualized, so that they are more easily understood for engineering management students majoring in non equipment specialty.

**Guiding Students from "want me to learn" to "I want to learn"**

Interest brings students into the hall of knowledge. Students are led into the difficult middle learning process and finally reach the other side of the victory with the help of self-control and endurance. Therefore, first of all, students' interests must be cultivated. The new development and new application of this subject could be integrated into the teaching process so that students can really be stimulated to learn. For example, Wuhan is a pilot city in the nationwide vigorous development of sponge city construction, and there is an ongoing sponge project near the school. Theoretical teaching can be completed making full use of this advantage. The key technical base of sponge city is the rainwater treatment technology, which taught in class is rather dull and abstract. And in engineering field, theory learning and production practice can be perfect combination. This not only helps the students to master the theoretical knowledge, but also helps them to understand the benefits of ecological environment and social economic development of the mode. Their responsibility could be strengthen, learning desire could be improved at the same time.

In addition, encouraging students to participate in various competitions will help them to develop their sense of pride and increase their chances of active learning.

In this process, the leading role of teachers is critical. Teachers quickly familiar with students can cultivate good feelings between teachers and students, which helps students to form the identity of the discipline. Therefore, teachers can use QQ, WeChat and other social software to give professional guidance to students. Students can be led to improve learning interest, trained to improve their professional qualities. finally, they are put into the realm of knowledge of water supply and drainage.

**Strengthen the Teacher's "Double Teacher" Self - training, and Realize the Self-growth of Teaching by Means of Scientific Research**

First of all, in order to guide students in engineering practice better, teachers should continue to follow the standard of "double-qualified teacher" to improve themselves, and to improve their own engineering practice ability. In order to teach the building equipment which is one of technology platform courses need strong practical skill, the teachers with the background of engineering education, not only need to continue the thorough study in the engineering fields, but also should go out of the school gate and take part in the engineering practice. The more teachers learn from enterprises of engineering, construction, etc., the more teachers will be able to update their knowledge and improve their practical ability. At the same time, teachers should also take part in various vocational qualification training and examinations from the perspective of upgrading vocational skills so as to consolidate the theoretical level.

University teachers, as educators in engineering management, have obtained the corresponding qualification certificates, such as registered equipment engineers, cost engineers, supervision engineers and other qualification certificates, which are the affirmation of their professional abilities, and also the basic ability requirements of engineering practice and teaching work.

Secondly, ideas should be changed that scientific research would be helpful to the improvement of teaching level.

Teaching and scientific research have the same goal. Education and scientific research is an important component of promoting social and productive development and progress. From this point of view, there is no fundamental contradiction between them. relationship between them is also a unified, complementary and mutually beneficial.

On one hand, teaching would help scientific research. With the continuous improvement of the level of teaching, a good research and teaching team will be created. This process is not the process of imparting knowledge, but also a process of discovering new knowledge and new problems in the teaching interaction, which helps teachers to find new topic and put forward new projects of scientific research. on the other hand, scientific research would also help teaching. Scientific research requires creative mode of thinking and vision. after the deep study of science by their own,
teachers would also train students with the mode of thinking and vision thinking, which would improve their teaching to higher level.

References