Rebuilt of Curriculum System and Reformation of Course Based on CDIO

ABSTRACT

In order to improve significantly the quality of the engineering education, adaptating the requirement of the industry and public,it is necessary for us to research and practice the new teaching model. According to the concept, syllabus and standard of CDIO, we have rebuilted the curriculum system of all programs in our university.

A new objective of each program is reformulated for training qualified engineers. To achieve our objective ,we enhance the cooperation between university and industry, and rebuilt the curriculum system and reform the content of cuorses together. Throuth the reform of courses, the active learning for students is motivated. Problem/project/case based learning have application in the different courses. Especially, the three level projects based on subjects/course clusters/course is designed in the traning program. And some of engineering design contests provide the more opportunity to students for active learning. All efforts is obvious to improve the integration capability of students.

Keywords:
curriculum system, reformation, active learning

Interoduction

As rapid development of economy and globalization of industry development , engineering education in China face a new challenge. More and more global corporations access to market in China, so there are large needs to different engineers. On the other side, many problems are existed about engineering education, and it is difficulty for adaptating the requirement of the industry and public. For exemple, it is focused on the relative completeness of suject system and neglected the importance of engineering practice when a curriculum system was maked up. In such a case, most granduates lack the experience of

engineering practice. At same time, it be come the main problem about the shortage of skilled personnel for many companys. This paper describes our university how to rebuilt curriculum system, to integrate with our situation, according to the concept, syllabus and standard of CDIO[1]. Of course, one of the emphases of the reformation is to increase the ability of student's engeering practice[2].

The goal of rebuilting curriculum system

It is important what should be included in the reformation. Through analyzing our students, especially the investigation of third-party institution, we find that is extra necessary to strengthen abilities of integrated application and expression, to increase real engineering practice. According to the formulation of United Nations Educational, Scientific and Cultural Organization, overall goal of our reformation is to let students learing to know, to do, to live together, to be. Through rebuiting curriculum system of all engineering programs including Electronic engineering, Telecommunication engineering, Computer science, Software engineering, Environmental engineering and so on, We hope that can
boost the competitiveness and improve the quality of employment of guanduates. There are indications that the situation is improving. Now more and more large scale companys hope for good cooperation between us.

Design of new curriculum system

Most impotant thing is to change the former concept and to draw up the training standards. The new curriculum system based on engineering-capability is designed. All courses are re-organized. In order to stimulate student's enthusiasm of studing engineering and know preliminary engineering system early, we append the introduction course to engineering. Some of Courses are decrease. Other courses are merged with others. The graduate credit was adjusted from 190 to 175 as so as to provide more time for doing projects. New training of engrneering practic is increased, Including three level projects. First

level projects is based on a course, including regular experiments and free experiments. Second level projects is based on course clusters to train abilities of integrated application, including specially designed competition. The purpose of third level projects is to help students step by step to know engineering systems and the whole process of a systems designed. [5]

In order to overcome the difficulty about shortage of engineenring teachers, many senior engineers of industrial community are invited to work with us during we desige the curriculum system.

Reformation teaching method

Imparting method of teaching is prevalent in china. The method have restricted active and creative thinking of students. New teaching methods are necessary to adopt. In the foundation courses, our teachers try to use the way about problem based learing and case based learing[3]. For example, PBL is used in teaching Physics. A new text book is written by the order of movement, field and wave motion. In the professional courses, many teachers recommend to use projects based learing. For example, Microprocessor and Micro-computer System, students were separated into diffent teams and work together to do a project such as control systems of traffick light. Everone will be a role of the engineering practice.

Some of real engineering projects is embedded in the course, such as design of consumption electronic products and program of mobile phone games, in the programes of Computer science and Telecommunication engineering.

Student's attitude of active learing is improved effectively. At same time, learning of evaluation are reformed to meet the challenge. The process assessment bencome an important component of total score. Especially, peer assessment not only can give a daily work record, but also can train sense of responsibility and judgement of students.

Improve the practice environment and management

The practice environment is basis to train good engineer[4]. Of course we invest to built some of new labs, but the main effort is to focus on how to exploit the laboratories now in campus. Firstly, open laboratoryies to students are expanded. Some of Labs are managed by themselves and serve for the different association of fancier of technolgy. Then the competition mechanism based project is introduced. If you have a project agreed with adviser, you can use the lab freely. On the other hand, we energetically look for opportunities to cooperatie with industry. Some companies help us to establish the student's practice bases in campus and in the companies that provided good traning for our students.

Conclusion

The studengts traning by project/problem/case based learing are better than others on finding, asking, thinking and solving engineering problems. There are more opportunilitie to get a good job for the guanduates by the reformation of course. All efforts is obvious to improve the integration capability of students. For exemple, the many reports of students comment about learing by team: that help us work together and nobody fall by the way because encouraging from peer. The achievement of contriwide technolgies race are outstanding, especially competition of electronic design. The design of students have got a reward of Samsung. And other programs in our university also reforme the cuorses according to CDIO, example accounting program. We will continue to improve significantly the quality of the engineering education according CDIO standard.

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