

Teaching Management Problems and Strategy Research in the Engineering Course of Colleges and Universities

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Abstract. In recent years, we have increasing recruit students in colleges and universities. Our country let more and more people can receive the higher education and train much professional talents. Engineering course is the most important part of college education. Training practical talents as the guiding ideology, it places significant function during the economic growth. At present, the global scientific and technological level change quickly. The new technical production and operation emerge in endlessly. This provides great challenge for our engineering course education. How students can adapt the social developing requirement and have the related professional ability is the important question that each engineering student should consider.

Keywords: colleges and universities, teaching management, engineering course.

1. Introduction

In the engineering course system, engineering education places the primary function. Although there has different learning contents and major among engineering students, we can manage and organize them follow the engineering model. This article is aiming at the engineering education to do the evaluation and guidance. For the college students, there not only need to learn the basic major knowledge and cultural knowledge. The most important is applying the knowledge into practice. This is very emphasizing for the further professional accomplishment. During the learning process in college, we should organic combine theory and practice, so that we can resolve the question and service better for the nation and society. Most countries pay attention to the higher education development that match the college teaching and present social development. Our country is also attaching importance to the higher education. College and university development is the important thing. We should search and perfect the higher education system continuously.

2. Present education of higher engineering course

2.1. Major setting actuality and characteristics

Our engineering course is based on the Soviet Union teaching mode. We do the special major setting that combine with the practical condition. The different divisions of social labor divide out the various majors. Each major will set the relative course system based on the training target that each student has the suitable knowledge structure and manipulative ability. Educational administrative machinery will work out the uniform major catalogue based on the social requirement. Each college will under this basement and follow the practical condition to set the major with independent characteristic. Until 1993, our major catalogues have total large classes with law, economics, literature, engineering, agronomy, history and so on. There have 22 secondary classes and 181 majors. With the society improvement, technology increasing and

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management updating, there needs add or delete some majors or some course structures for the social requirement.

At present, our engineering teaching development is connecting with international standards. Some majors have reached the international leader level. The characteristics are as follows:

- Major division refinement. Our higher education target is training the high professional talents and emphasizing the innovation training and comprehensive quality training.
- Effective professional evaluation. In civil engineering, there has built the evaluation standard. The teaching contents of evaluated colleges only need to do the comparison with the standard. However, a large amount of majors have no uniform evaluation standard. The colleges and educational administrative machinery should make common efforts for doing the perfection.
- Pay more power on the applied subject development. With the economic development, there have great requirements for the professional talents. Most colleges modulate their training plan.
- (There has small elasticity of major setting model. It is mainly show in the management, student major selection should be determined when they do the school enrollment.

2.2. Course setting actuality

At present, our colleges' courses include four parts. They are public basic course, specialized core course, specialized course, and practical courses. The public basic course is training the comprehensive quality. The course period is various based on the occupied quantity in different colleges. In basically, it place 50% in the credit hour. It combines with English, higher mathematics, philosophy, physics, foreign language, Chinese, computer application basement and sports. Some students that want to be the professional high-class engineer will learn the theory basement of specialized core course. It place 30% in the credit hour. Compare with the developing countries, this ratio is obviously low on the international level. Specialized course is the key point for someone to be the professional talents. It is also the expression, which compare with other majors. It places 20% of the occupation. In this ratio, there includes practical course to train the talents. We should do some relative adjustment for this ratio.

2.3. Talents training characters in our colleges:

(1) Combination of college and company

Colleges, enterprise, and society combine with each other. They are guiding with the market, aiming at the talent training. Moreover, strengthen the theory knowledge. At the same time, promote the technology innovation.

- “Professional” talent training

Under the guidance of national administrative teaching department, complete the teaching index follow the teaching mission. Based on the completed basic knowledge by students, we set the specialized course breadth and depth as far as possible.

- Slow update

Not matter in teaching method or teaching model, the update speed is very slow. It is old-fashioned which compare with the fast economic development. The colleges have not got rid of the traditional teaching. Teacher is the leader and there has little communication between teachers and students. Students are under the spoon-feed education and lack of proactive learning spirit and independent thinking ability.

3. The existed problems and reason evaluation in teaching management

3.1. Existed problems

- Major setting

In the 50s of last century, our major model built under the matured Soviet model. That is suiting for the economic and society development at that time. However, in the 60 years development, there have the earthshaking changes in science, market, management, and international modality. The traditional major structures are no longer satisfying the present requirements. Although we modify the majors and courses from last 80s, there still existed so many problems. They are expressing in the following details. Firstly, the major settings are too refined that students will have little area for the social service with employment

shortage. Secondly, for the economic trend, most colleges are seeking for the science and technology development without the actuality. They blindly set some new majors. After the fresh setting, most colleges and universities cannot satisfy the requirement not only in teacher team but also in the practical equipments. This makes the lowly professional quality for students. Thirdly, after years of market economy openness, some colleges and universities are still waiting for the uniform management and social resource integration by the government. This condition greatly damages the college management autonomy and positivity. Then, it will form the college teaching stand still and refuse to make progress. Moreover, it will not positively adjust the major setting for the social practical requirement.

- Course setting problems

During the long term, our country pays attention to the science and despises the liberal arts. Although, the engineering knowledge places important function to student employment and development, we should emphasize the comprehensive quality training except the professional training. Therefore, the colleges and universities should open some course such as innovation education, quality teaching, etiquette education, and enterprise education. These are placing the inestimable function during the student development.

3.2. Reason evaluation

- Knowledge system imperfection

In our country, we are excessively seeking for the systematicness, scientificness, and completeness of content subject. At the same time, the textbook compiling is not matching with the market development. When the colleges are seeking for the knowledge systematicness, they will discard relative high technology. Some colleges or universities pay too much attention to the teachers' scientific research ability in order to extrude the scientific research and discard the teaching effect. Especially the new major from fresh technology and field, the course knowledge system has not timely connected with the social development. This creates the learned knowledge has not using in the working. Otherwise, some required technologies and knowledge students not learn in the college.

- Student quality needs to be improved

Most college students have the strong theoretical knowledge. However, they are short at manipulative ability. Although most students understand the operating principle and working process, they do not know where to start when they are working at the reality site. The long-term traditional teaching model makes most students are lack of innovation ability. They cannot transform their theoretical knowledge into the reality scientific and technological achievements.

There have some colleges who are seeking for the students' employment ratio. They pay much attention and financial resources to support the practical activity but neglect the training of comprehensive quality and humanity spirit. These students will have few devotion spirits and will limit their developing space.

Some students have the range independent study ability is causing form the long-term spoon-feed. Students are learning under the district guidance. If the teachers do not supervise them, they will lose the direction. They do not know what to learn, what to do and waste their time in the school.

- Lack of enterprise support

The combination between college and enterprise has been provided for many years. The bad operation is for the lower popularity of engineering course. They do not connect tightness with the enterprises and lack of communication. Moreover, the enterprises will consider about their benefit under the market economic. It is very hard to drop out lots of generator room, factories, time, and staff for the students' practical operation while they are developing themselves. Most engineering colleges will apply the site practice for the students. They only look around and lack of manipulative operation. This can directly influence the student quality improvement.

4. Strategy research

4.1. Major setting strategy

- Broaden the major range

The present teaching target is increasing the student ability training and quality practice that aiming at the comprehensive talents. There have reached the consensus during the years of teaching exploration. The teaching revolution cannot carry out the “A Cut” model. We should interact the teaching among various courses and provide different choices for the students’ employment. Under the premise of professional target determination, we should implement the flexible adjustment model.

- Vigorously promote the applicability major

With the fast development of our economy, the first industry and second industry decrease the proportion in national economy year after year. The third industry is under the rapid development. This means there need the higher education to do the relative adjustment to strengthen the professional talents training of the third industry in order to suit for the social development.

- The setting of interdiscipline subject major

The increasing development speed of scientific technology creates the fresh subject and boundary science. Interdiscipline subject major is not limited in the same major. It is more and more commonly in cross-specialty and cross subject. For example, the engineering major and management science major combines to the engineering management science. At present, the knowledge is developing from the single linear development to the multidimensional nonlinearity development. There form the solid development mode gradually. The higher teaching department is the front line of scientific research. How to teach the students into the comprehensive and innovated talents and how can make the students to solve the challenges in reality is the development target and motive power for the major setting of education industry.

4.2. Course setting strategy

- Increase the elective course

During the long-term education, our higher education is setting the course based on the talents in need. There is lack of consideration for the comprehensive quality (physical quality, psychological quality, dedication spirit). At the same time, the students’ specialty and interesting is not taking into consideration. With the information period coming, most colleges make pointed references to decrease the required course ratio. Moreover, they increase the elective courses, provide more choices for students in order to expand students’ knowledge and improve humanity quality. Then, help the students’ further development.

- Open the courses combine with teaching and scientific research

Teaching is not just remembering the contents. It is training students the habit of using their brains and hands. Moreover, train them to be the innovation talents. Incorporate the teaching and scientific research. Develop the students’ subjective initiative, encourage their learning interests and degree of professional recognition.

- Add humanity course

The professional talents in the society are not only needs the high technology level, competition ability and innovation conscious. The most important is the lofty moral qualities. During the moral education progress, the teacher should treat every student in fair and equitable attitude. At the same time, strengthen the training of humanity education. Mix the humanity course and specialized course will rich and colorful the class. Moreover, students can superb professional ability. This is fully expressing the close relation between humanity and science, direct students the right philosophy and world view.

5. Summary

This article is aiming at the existed problems during the engineering course management. At first, we detailed describe the present condition of engineering course teaching in the college education. In the second place, we represent the problems during the teaching process and evaluate the reason. Moreover, aiming at the reason, we do the discussion from major setting and course setting. Then, we provide the relevant solving plan. For the limitation of article length and the writer ability, there still have much improvement space for the management strategy of engineering teaching. The interested reader can do further perfection and modification on this basic.

6. References

- [1] Zheng Nanning, Innovation talents training in engineering teaching, Research in Higher Education of Engineering, 2005
- [2] Fu Shuigen, Establish the engineering practical teaching system with China characteristic, China University Teaching, 2004
- [3] Cai Yuzhuo, Higher engineering education in Sweden, Finland and Denmark, Research in Higher Education of Engineering, 2005
- [4] Zhang Guangdou, Wang Jisheng, China higher engineering education, Beijing: Tsinghua University Press, 1995.