The Exploration of Ways for Keeping Teaching Quality of Basic Course with Class Hours Reduction

Yan-qiang LIU
College of Pipeline and Civil Engineering, China University of Petroleum, Qingdao 266580, Shandong China

Keywords: Basic course, Class hour reduction, Teaching quality, Way, Exploration.

Abstract. For the contradiction between class hour reduction of specialized basic course and quality requirement of professional education, author investigated and analyzed its main characteristics and factors affecting it and explored the ways and measures of solving it by practice. It is showed by the exploration that teaching effectivity and quality can be promoted effectively and that the contradiction be relieved by improving teaching content system and narrative form, optimizing teaching model and method and developing and using fully network platform.

Introduction

With the development of modern science and technology, the forms and contents of high education are perfect, new courses spring up and class hours of old ones are modified constantly. These changes are mainly showed at increase of new courses and continuous reduction class hours of old ones, especially, basic courses or specialized basic courses. Only when new knowledge in science and technology of times is constantly poured into specialized education, can the specialized education be not eliminated by times. Increasing new knowledge or new course with fixed class hours in specialized education, class hours of old basic courses or specialized basic courses are reduced necessarily. But basic courses or specialized basic courses are the foundation of the specialty. If their teaching effect can be not guaranteed, the foundation of the specialty is not solid so that the professional education is damaged, which make it is difficulty to drop requirement for basic courses or specialized basic courses by a big margin. A sharp conflict and contradiction between invariant requirement for basic courses or specialized basic courses and needs of their class hour reduction, called as the contradiction briefly in the following[1, 2], is emerged. That the contradiction affect universally on keep and improvement of quality for high education is paid wide close attention to [3, 4]and demand prompt solution.

In the paper the contradiction is investigated, analyzed and studied by practicing. Its main characteristics and effect factors are understood and summed. The main ways and measures of solving the contradiction are explored preliminarily by practicing and demonstrating, by which improve teaching efficiency, avoid bad effect coming from the contradiction and keep and improve teaching quality. The high education is made compromise more new advance and practical information coming from reform and development at all times and have a good necessary professional basis in order to provide effective references and theoretic basis for enforcement, control and improvement of teaching process of basic courses or specialized basic courses and establishment of police and constitution in high education.

Main Characteristics and Effect Factors of the Contradiction

It is found by investigating and analyzing widely that the contradiction have characteristics of universality, prominence, no choice and far-reaching influence on teaching quality, etc..

The contradiction universality is reflected in that there is the contradiction in basic courses or specialized basic courses in all of subjects and specialties in all of universities, but prominence degree of the contradiction prominence is different. The contradiction prominence shows in that shortage basic exercises, a bad grasp of basic knowledge and shortage power for its application effect seriously
the study of succeeding courses, graduation project and the level of application of knowledge in their work. For example, the shortage mathematical basis, such express confusion of vector and scalar, hazy solution of differential equation and differential of composition function and multifunction, etc., is felt obviously in the teaching of theoretical mechanics so that effect on smoothly developing of the course and teaching result. And class hours of theoretical mechanics are reduced constantly. The contradiction between class hour reduction of basic courses or specialized basic courses and specialized requirement is very outstanding. Theoretical mechanics is the best basic engineering mechanics so that its teaching result will set off a chain reaction to whether succeeding teaching or engineering application. This show naturally far-reaching influence of the contradiction on the teaching quality. The influence has already shown in the study of succeeding courses, the graduation projects and the postgraduate papers. It can be expected that large influences are exerted on the level of succeeding work and scientific research by the contradiction. Some influences may be not saw for one or two years so that course teaching improved by practicing is difficulty. However, with constant development of science and technology, the forms and contents of high education must be perfect and poured constantly into by new knowledge in science and technology of times. Increasing new knowledge or new course with fixed class hours in specialized education, class hours of old basic courses or specialized basic courses are reduced necessarily. But the basic courses or specialized basic courses are the foundation of the specialty. It is difficulty to drop requirement for basic courses or specialized basic courses by a big margin. Therefore, the contradiction is objectively unavoidable.

The contradiction is effected by two factors. One of the factors is the requirement of development of objective situation, which is unavoidable and can be not changed and can be fit in with positively and initiative in adequate appearance, attitude and form. Another is the teaching content system and the teaching model and method. When the teaching content system optimized and the suitable teaching model and method perfected are used, the contradiction can be mitigated and solved. Something can be did in this respect.

Ways and Measures of Solving the Contradiction

For the contradiction between class hour reduction of basic courses or specialized basic course and quality requirement of professional education, the contradiction characteristics, factors affecting it and its effects on teaching quality are investigated and analyzed widely. The preliminary ways and measures of solving the contradiction are explored by long-term teaching practice, analyzing and summing. The focal points are at that explore how the teaching quality is kept and improved by optimizing teaching content system and improving teaching model and method. They are synthesized as follows.

Simplifying Teaching Content

By understanding sufficiently practical requirement of professional education, the teaching content is classified, divided into different levels, optimized and chose by means of a sift. The core content system consist of necessary concepts, methods, principles, engineering applications and relevant development of science and technology, etc., which must be detailed completely. Ordinary and extend contents can be sketched properly. The useless, outmoded and a little influence ones can be deleted. By these, the teaching content system is optimized and the teaching compromises science research. By optimizing the teaching content system, practical requirement of professional education is reflected sufficiently and teaching of the unnecessary contents and wasting class hours are reduced in order to improve teaching efficiency.
Improving Exposition Form of Teaching Content

Method of theoretical exposition is optimized and form of logic inference is improved by constant practicing, trying, researching, summing, synthesizing, adjusting. Using as far as possible analogy method and deduction reasoning in narrating teaching content, for example, the theoretical exposition can be made simplifying, systematic, well-knit and synthesizing. Repetitions of content and exposition in traditional way of stating ideas or facts are reduced largely. The length of theoretical exposition is shortened. Synthesizing application can be strengthened. Class hours of explaining the theory are saved. The teaching, comprehension and mastering is made more convenient. Improving exposition form of teaching content, software base for keeping and improving the teaching quality with class hour reduction is established.

Optimizing Teaching Model and Method

It is shown by long-term practicing that using preferentially the narrating form of deduction reasoning can make teach theory and method more complete and systematic and reduce repetitions in exposition of general and special matter. Teaching by using as far as possible analogy method, which using mastered knowledge analogy present similar content, can make the understanding easier and save the class hours. Making and using timely multi-media that compatible advantages of traditional teaching and meet cognition law of students can make the teaching activities more convenient and high-efficiency. Using sufficiently network system, the classroom instruction can get effective supply, which supplements short of the classroom instruction and improving study efficiency by form of videotape, MOOC, small class, problem answer in net, etc.

In a word, by improving exposition form of teaching content and optimizing teaching model and method, good results of that improve the teaching efficiency increased and that the teaching quality is kept and improved can be achieved, and the contradiction can be relieved.

However, there are different requirement for different specialties and different courses. Different courses have different characteristics. The concrete course has concrete effective ways and measures of solution for the contradiction. The above-mentions is for your reference only.

Practice and Understanding for Ways and Measures of Solving the Contradiction

As specialized basic courses of engineering specialties such as mechanical engineering, civil engineering, and so on, class hours of such courses as theoretical mechanics, material mechanics, etc. have be reduced for many times. For example, class hours of theoretical mechanics are reduced from 120 till 64, 56 or 48 hours. However, quintessence of theoretical mechanics is the dynamics. The statics and kinematics is the basis of the dynamics. The requirement of integrity of the content make the teaching content can be not reduced by a big margin as the class hours, which make the contradiction protrude very much. The experience is very intensive in long-term teaching practice. The following works are did for keeping the teaching quality.

Since expositions of the available teaching material about courses of engineering mechanics fit in with characteristics of that courses of the specialty are less and class hours of a course many at the past. They are in proper order and easy understanding. But they are not enough systematic and wasteful for class hours mostly. When the class hours of a course are reduced by a big margin and the integrity of the course content must be kept, it is necessary that the forms of the exposition are reformed. Starting with the elasticity, using the form of the exposition of analogy method and deduction reasoning, basis of engineering elasticity is compiled [5]. Repetitions of content and exposition about tri-dimensions and plane problem are reduced and the synthesizing application be strengthened in the book. It is convenient for the teaching, understanding and mastering of the elasticity. On the basis of long-terms study and practice, the theoretical mechanics is compiled [6]. In the book, logic relation of statics is rationalized and repetitions of content and exposition about tri-dimensions and plane problem are reduced by demonstrating systematically equivalent, reduction and equilibrium of system of forces by taking the concept of principal vector and principal moment as
main means. Logic relation of kinematics is deduced systematically by using vector method. Exposition of kinematics is more simple, systematic and comprehensive. The length of its theoretical part is shortened largely, which approaches a half of length of other teaching material in the same content range. The synthesizing application be strengthened in the book. It meet the requirement of keeping teaching quality with class hour reduction.

When multi-media teaching spring up and is popularized, by investigating, analyzing, practicing and studying deeply to a variety of courses, it is found that multi-media teaching has an advantage in conveying information. If multi-media teaching compromises the advantage of traditional teaching in exchanging and feeding back of information and specialties, level and capability of comprehension of the students are considered fully in making and using multi-media and designing lesson plan, the teaching activities will be more convenient and high-efficiency and the contradiction can be relieved.

By studying of items for establishment of network resources of long-distance teaching of theoretical mechanics and establishment of key course of vibrational mechanics, it is understanding that students can obtain more information about the course and their demand can be met and their interesting for study can be encouraged if developing and establishing rationally perfect network platform and rich teaching resources of the course. This can be taken as effective supply of classroom teaching with class hour reduction.

Conclusions and Prospects

By improving exposition form of teaching content, optimizing teaching model and method and developing and establishing perfect network platform and rich teaching resources of the course, the teaching efficiency increased effectively, the contradiction can be relieved, and the teaching quality can be kept and improved.

The different courses for different specialties have different effective ways and measures of solution of the contradiction for keeping and improving the teaching quality with class hour reduction. With the development in the teaching research and practice, there will be new find necessarily.

References


