Exploratory teaching method of college courses based on the module thought

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Abstract

Colleges and universities shoulder the important mission of training qualified contemporary college students. With the development of contemporary social and the rapid promotion of information level, teaching models and methods are faced with great challenges. Therefore, this paper analyzes the problems existing in the classroom teaching in Colleges and universities, combined with the students' thinking and learning ability. The module thought is introduced to the teaching process. A practical case is selected to illustrate the validity of the method. The results show that the teaching method proposed can enhance students' interest in learning professional knowledge and improve their communication skills.

Key words: Active learning; Module thought; Teaching Strategies; Higher education

1 Introduction

The popularization of higher education is a convenient way to improve the overall quality of the people of this country. The main purpose of higher education is to gain an in-depth understanding of professional knowledge and encourage further learning. The rapid growth of social economy has the potential to greatly accelerate and democratize the process of higher education popularization. However, the enrollment and graduation rates are blindly pursued by colleges and universities neglecting to cultivate students' ability of thinking and absorbing professional knowledge [1][2]. As a result, the gap between the service quality and the service quantity is increasing. Therefore, it is necessary to adopt a series of reasonable classroom teaching strategies to improve the quality of service. Advanced teaching projects and a set of effective teaching methods can improve students' innovative ability [3][4].

Students, in colleges or universities, have a relatively formed thinking mode. After getting rid of high school pressure, some students addict to their own information transmission networks, neglecting the importance of professional knowledge learning and teamwork[5][6]. Hence, how to improve the teaching efficiency and stimulate students learning enthusiasm is a critical issue considered in this paper. Modularity is a way to decompose complex systems into better managed modules. The main advantage of this method

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is that complex systems can be divided into simple management and control modules. Introducing the modular control method into the teaching process, students can be divided into several module groups. This method can increase cooperation and mutual assistance within modules, and it is of great significance to improve the teaching quality of university courses.

In this paper, an exploratory teaching method is proposed, integrating the modularity control concept and the advanced question thought, based on integrating the teaching content of the professional knowledge system. In detail, the number of the team and the quality are controlled by a simple process, and then, the project teaching method and the advanced question thought are adopted to instruct course teaching.

2 Modules of Employable Skill

In education teaching theory, small-class and discussion-based teaching are considered to be a good teaching method, and the teaching effect is welcomed and affirmed by students and teachers[7]. However, it is hard to come true when the teaching demand is higher. The idea of modularity is to divide a large group into several small modules for the convenience of management. This method can integrate small class and discussion teaching method scientifically and improve students' ability of cooperation and practice.

2.1 Module number determination

The division of the students' modules in the teaching course has a direct impact on the teaching quality. If the number of students in the module group is too large, some students cannot be integrated into group activities due to personality problems, else, it cannot realize the effective communication among the members of the group and the improvement of students' teamwork ability. According to the practical experience, 5 to 8 students per module is the best size. The specific process is shown in Fig. 1, taking 5 students in each module as an example.
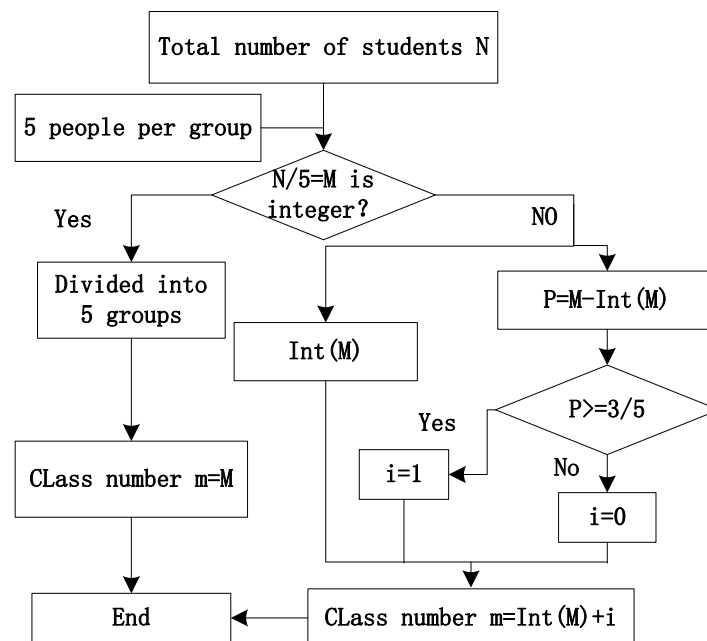

Fig. 1. Student grouping process.

From Fig. 1, the detailed procedures are presented as follows.

Step 1. The number of students choosing the tasted course is computed before the teacher are taking on class teaching. Students in the teaching class are grouped into different module. Each module has 5 students. Turn to Step 2.

Step 2. If the number of students is an integer multiple of 5, turn to Step 3, else, turn to Step 4.

Step 3. The number of modules is N/5=M=m. Turn to Step 9.

Step 4. The integer and fraction parts of N/5=M are extracted respectively. In detail, the integer and decimal can be shown as Int (M) and P=M-Int (M). Turn to Step 5.

Step 5. If the P is greater than or equal to 3/5, the rest of the students can be independent, turn to Step 6, else, turn to Step 7.

Step 6. Additional module number is 1. The number of modules is m=Int (M)+1. Turn to Step 8.

Step 7. The number of modules is m=M. Turn to Step 8.

Step 8. End of grouping process.

2.2 Project tracking strategy

In order to enhance teamwork and deepen professional knowledge in the teaching process, it is necessary to set up some practical courses according to the requirements of the course knowledge system. In detail, the practical project themes are set based on the professional course content and the project feasibility. Then students can design the implementation of the program and formulate specific construction process through a series of discussion and discussion assessment in their module. Teacher as a director is responsible for monitoring project progress and quality.
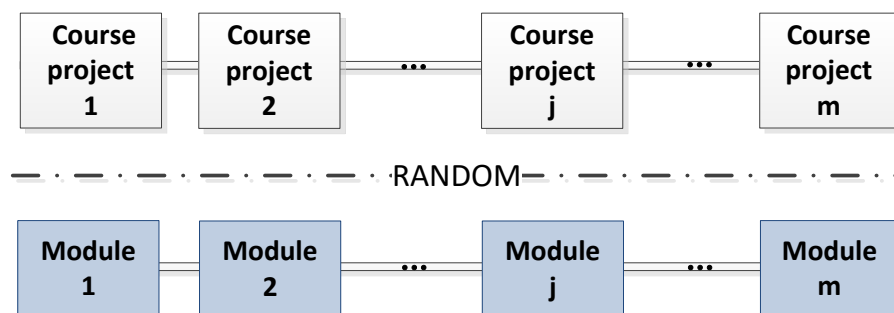

Fig. 2. Project setup and assignment.

In Fig. 2, the number of course projects is equal to the number of modules. These course projects are randomly assigned to each module group. Furthermore, each module's topic is different, but relevant. In the process of project implementation, the teamwork can improve the ability of course acceptance. In addition, each module needs to hand in a series of project material and results report.

2.3 Advanced classroom teaching

The advanced classroom teaching as a part of modular course teaching, mainly considers the classroom teaching and interaction. The method focuses on strengthening the interaction between module groups and students' subjective initiative. The advanced classroom teaching concept is shown as Fig. 3.
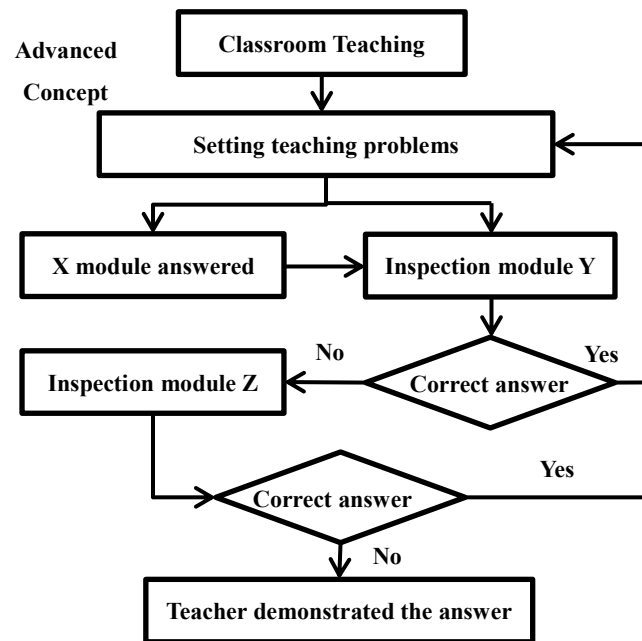
Fig. 3. Problem solving process.

According to Fig. 3, the process of advanced classroom teaching is presented as follows.

First, teacher should set a series of questions based on the professional demand. In class, a question is set to students and the module X is randomly selected to answer this question. Second, teacher may randomly choose the module Y to check the answer of the module X given. If the answer the module X given is right by the module Y proved, the class is continue, else, the module Z will be chose to check the answer of .the module Y. Similarly, if the answer the module Y given is right by the module Z proved, the class is continue, else, teacher will analyze the question and give the right answer.

3 Education practice

Take the course "Transportation planning and design" as an example, which is a compulsory course for undergraduate students of university. The basic information of course is shown in table 1.

Table 1. Basic information of course teaching.

Course title	Level	Period	Credit	Evaluation	Major
Transportation planning and design	undergraduate course	32	2	examination	Transportation

There are 46 students studying for "Transportation planning and design". According to the flow of module number determination, students are divided into 9 modules. In addition, there are 10 people in one module and 9 people in the other eight modules. The name of each module is given as Table 2.

Table 2. Name code.

Module name	Module 1	Module 2	Module 3	Module 4	Module 5	Module 6	Module 7	Module 8	Module 9
Number	10 人	9 人	9 人	9 人	9 人	9 人	9 人	9 人	9 人
Name	Surprise	AK	Hulk	Fire	No.1	Secret	Cold	Alien	Wind

At the beginning of first lesson, teacher presented 10 projects interrelated (e.g. "Analysis on the current situation of enterprise transportation line planning", " Urban traffic distribution strategy in Yangpu district of Shanghai" ,"Transportation enterprise location" and "Traffic demand analysis for medium business district"). In addition, a representative of each module randomly selected a project title. The students of each module would work out project plans and task assignments based on a series of research, discussion and analysis using the time after class. The teacher explained the basic research directions of different project subjects, and reminds the project time nodes and materials to be submitted timely in class time. All students in each module finished the corresponding project by adopting the method of team division and collaboration. Before the fourth class, the teachers has evaluated the programs of each module and given some suggestions for modification. In the following courses, teacher kept following up the project progress and guiding the project progress. The project gradually realizes the transition from teacher's guidance to student's leading during the process of project research, in order to improving students' ability to learn actively and cooperate with each other.

Classroom teaching is an important step to increase the knowledge of technical knowledge and terminology for students. In this practice segment, the advanced classroom teaching approach proposed in this class was applied to make teaching in class more active and convenient. With the amount of questions, a simple question was selected to specifically illuminate.

There are four stages from the generation of traffic to the distribution of traffic flow. Forecasting the four stages is called the four stages forecasting method. The question was given as "Please list which four parts are included in the four-stage method" in class teaching. Based on the advanced classroom teaching method, module AK was selected to answer this question, and then module Fire was chose to check the answer. The results show that the module AK gives a right answer which has be proven by module Fire. In addition, teacher presents the related explanation.

4 Conclusions

Exploratory teaching model of college courses based on the module thought can effectively mobilize students' enthusiasm in class and their initiative in knowledge learning and exploration. It fully embodies the student-oriented teaching mode and realizes the teaching mode of both in-class and off-course teaching. In detail, teaching after class is based on relevant subject projects of the course, which can make the knowledge learned in class be applied, and also stimulate students' ability to explore knowledge. On the basis of modular grouping, the teaching in class is integrated with the advanced teaching idea, which can promote the cooperative work of the members in the module group. However, the application of this teaching mode requires that the teachers can fully master the curriculum knowledge system.

Acknowledgements

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