Exploration of interactive classroom test method in universities based on the module thought

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Abstract

University is an important transit station for students to enter social life, undertaking the important mission of personnel training. Nowadays, a series of challenges exists in university education, such as the popularity of electronic information making students lack the ability to help each other. How to develop the mutual cooperation ability and active learning ability is an important topic in university education. This paper proposes an interactive classroom test method considering the learning characteristics of university students. The module thought is introduced to optimize the teaching system and help teachers to master classroom. In the interactive classroom test method, students can design the test paper based on the learning of course content and understanding. Then the different module group may use and review these test papers. The application and investigation of the proposed method are given by concrete practice. The results show that this method can enhance the spirit of teamwork and competition among students.

Key words: Active learning; Module thought; Test strategies; University education.

1. Introduction

With the improvement of economic level and comprehensive national strength, the demand for higher talents has increased significantly. In order to improve the national quality, university education is changing from elite education to universal education. However, the popularization of university education brings a series of problems. The main problem is the imbalance between the supply ability and the quality of education. [1] In detail, the teaching facilities and the number of teachers cannot meet the demand of students, resulting in a serious decline in teaching quality in universities. Meanwhile, more and more universities pursue the graduation rate of students blindly, ignoring the cultivation of students' morality and professional knowledge. [2][3]

To establish a healthy education system, we must improve the teaching methods. In the information age, the way for students to learn knowledge is increasing. However, it weakened students' teamwork skill, which led to the isolation of students. The task of higher education is to cultivate students' moral character, deepen the education and teaching, and realize the cultivation of high-quality talents. Therefore, it is

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necessary to adopt the scientific interactive teaching mode to improve the quality of classroom teaching and enhance the students' subjective initiative of learning and mutual assistance.

Classroom teaching in universities can be divided into two parts including classroom teaching and classroom test. [4] Specifically, classroom teaching mainly focuses on teachers' teaching ability and the driving ability of classroom atmosphere. The traditional classroom test is a test of teachers' teaching effectiveness and students' mastery of knowledge. Classroom teaching is a quick way to enhance students' professional knowledge and guide students' world outlook. In previous studies, educators and researchers have given many good suggestions and opinions on the teaching skills and methods of classroom teaching.[5][6][7]However, as an important part of testing the effect of students' professional knowledge learning, classroom test can directly reflect students' learning attitude and ability. Reasonable improvement of classroom test methods and increasing students' subjective participation can effectively enhance students' subjective initiative in learning.

The key problem to be solved in this paper is how to adopt a scientific student interaction model to enhance students' active learning ability, so that students can actively participate in classroom test, and then develop students' ability to ask and solve problems.

2. Interactive classroom test method

At present, although the rapid development of information technology has brought many conveniences to classroom teaching, it has also brought some problems. For example, some students are addicted to the Internet and neglect the training of professional knowledge and mutual help ability. Classroom test is an important measure to test students' knowledge learning progress and mastery level. [8] The traditional classroom test model is usually teacher-oriented, that is, teachers give test questions in stages according to the focus of the course content. However, this form of classroom test cannot make students actively accept the test. Students regard the test as a passive process. Therefore, this paper proposes the interactive classroom test method, focusing on improving the ability of active learning and mutual learning, based on the modular grouping idea.

2.1 Module grouping process

Module grouping mainly comes from computer systems. The idea is to divide the complex systems into controllable collections of units. The main advantage of modularized thinking in classroom teaching is the ability to divide large class students into controllable groups. It will simulate small class management to manage and teach. This method can improve the efficiency of teaching and simplify the management process. In educational practice, small class teaching is considered as a good teaching method, and the quality and effect of teaching have been widely recognized by educators.[9][10]Modularization can solve the problem that mass classroom teaching is difficult to manage and students' interaction is inert. It is helpful to develop students' unity, cooperation and innovative thinking. Module grouping is an important link in the development of interactive test method, which directly affects the teaching effect.

The module grouping method is determined by the contents of the syllabus and the number of students. Simple module grouping process is shown in Fig. 1. In Fig.1, M represents the number of groups, N

represents the total number of students, n represents the number of students in each group, k and i represent the integer part and remainder part of N/n respectively, and r represents the threshold value computed by Eq.(1).

$$r = [5(n + 2)/n]. \quad (1)$$

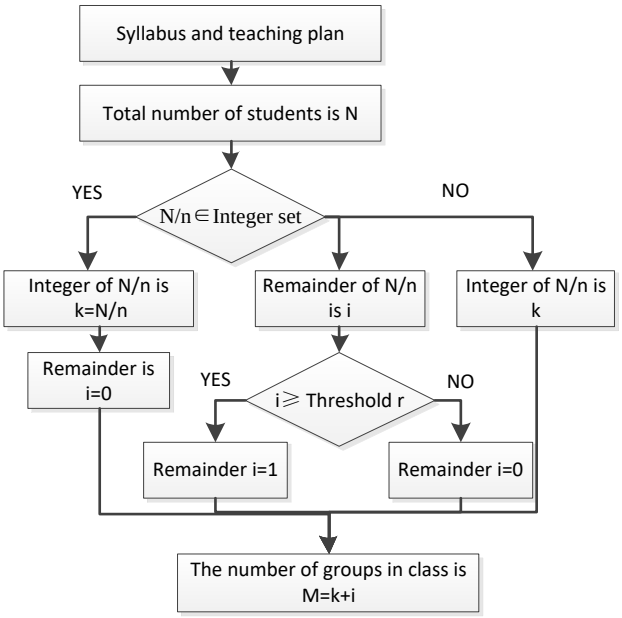

Fig. 1. Module grouping process framework.

2.2 Test methods and procedures

The core idea of interactive test method is to let students participate in the design process of test questions, so as to deepen the students' mastery of knowledge and mutual assistance among students. The method is divided into three stages, and the basic process architecture is shown in Fig. 2.

The first stage is to build a test bank. It mainly takes the module group as the unit. The students in the module group will determine the question bank of the module group according to the importance of classroom teaching knowledge and their own learning situation. Because there are some differences between the students' learning ability and their cognition of the key contents of the course, the test question banks given by each module group are not the same.

The second stage is the selection and correction of test papers. In order to improve the fairness of the examination, each group representatives randomly select the test paper and give the answers. Moreover, the examination papers submitted to each group are distributed to other module groups randomly. Each module group can review the examination papers based on their corresponding rules and methods.

The third stage is verification by teacher. The teachers mainly check the answers and scores of the examination papers. In addition, the excellent answer group and review group will be judged by teacher. This part of the award is added to the class performance score.

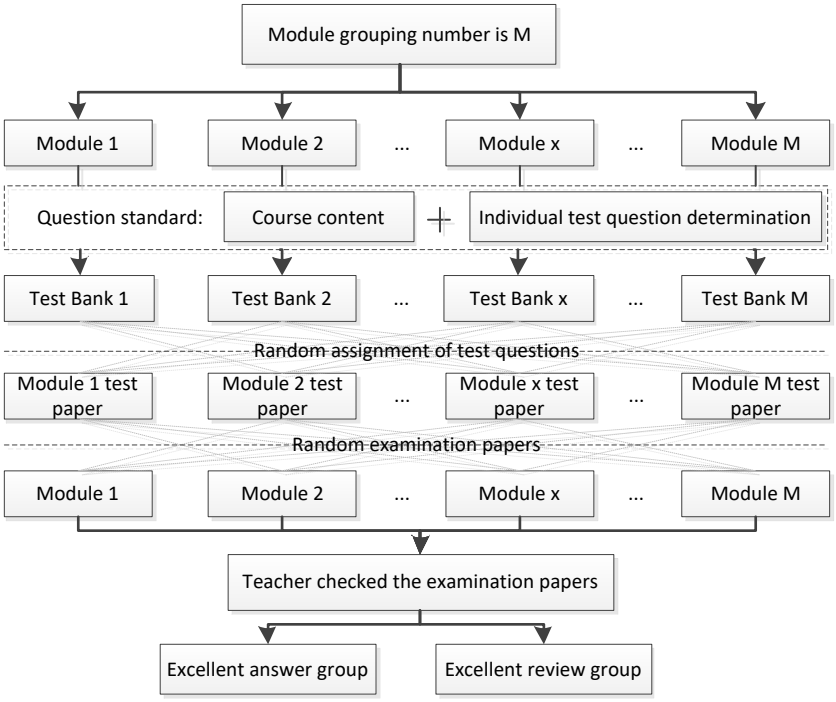

Fig. 2. Interactive test process.

The interactive test method is based on module group. This method mainly inspects the students' learning and group cooperation. It can let the students participate in the classroom test as the main body and enhance the students' subjective initiative in learning. This test mode proposed in this paper emphasizes the subjectivity and mutual assistance of students. Note that this test mode is based on the modular group. The cultivation of the sense of inter-team cooperation and the sense of inter-team competition is the focus of interactive test methods to cultivate students' world outlook. Therefore, interactive test methods can focus on the cultivation of students' world outlook, and at the same time, can improve students' active participation in learning.

3. Methods practice and results

Take the ***transportation planning and design*** course as an example, which is a compulsory course for students majoring in traffic engineering. We applied the interactive classroom test method proposed in this paper to the course and analyzed the results.

3.1 Practice design

The undergraduate student of grade three is majoring in this course. The number of students is 46. The specific information of the course is shown in Table 1. There are 32 school hours. In detail, the key content accounts are 20 school hours.

Table 1. Basic information of transportation planning and design Course.

Course name	Application level	School hours	Credit	Examination method	Major
Transportation planning and design	Undergraduate	32	2	Examination	Traffic engineering

As the content of the course is large, the curriculum test is divided into the midsemester and final exam. Due to the tedious work of finishing the final examination papers, the interactive classroom test method proposed in this paper is applied in the midsemester.

3.2 Application analysis

First, the teacher determines the number of module groups. Teaching experience shows that 5-8 people are controllable groups. Teacher chooses 8 people as the grouping unit for module grouping in this course. Therefore, according to the total number of students 46, the class is divided into six modules based on the module group partition process. Furthermore, A, B, C, D, E and F are used to numbered each group so that they can be easily distinguished. Each module group sets test questions according to the focus of teaching and the mastery of the knowledge learned by the group members, and submits them to the teacher. Through the analysis of the test questions submitted by each module group, the teacher supplements the key content further. Finally, according to the interactive test flow chart of Fig. 2, the interactive review of papers was carried out. Specific grouping information is shown in Table 2.

Table 2. Module group information.

Module name	Number of students	Name	Test number	Choosing test number	Review module number
Module 1	8	A	1	2	4
Module 2	8	B	2	5	3
Module 3	8	C	3	6	1
Module 4	8	D	4	3	5
Module 5	8	E	5	4	6
Module 6	6	F	6	1	2

In order to further verify the effectiveness of the method, the teacher sent out questionnaires for students to evaluate it. The evaluation titles are mainly concerned with the improvement of learning interest in curriculum content, mastery of curriculum knowledge, ability to summarize curriculum content, team cooperation and mutual assistance, and sense of competition among teams. The questionnaires were distributed to all the students who took part in the course. The students would give a comprehensive evaluation according to the quantified scores of each item. The comprehensive evaluation results are shown in Fig. 3.

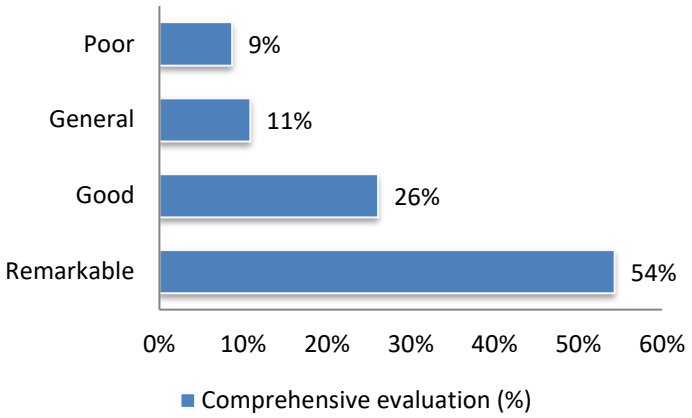

Fig. 3. Method implementation effect evaluation.

In Fig. 3, 54% of the students believed that the method presented in this paper could significantly improve the abilities in learning knowledge and teamwork. 26% of the students thought the test method was good. 11% of students think this method is effective and 9% of students think this method is not effective. In addition, the teacher gave a summary of the relevant opinions and suggestions from the students. The students' suggestions are as follows. The first suggestion is that the curriculum should increase opportunities for collaboration and internal collaboration among student teams, and that social practice activity should be added. The second suggestion is that teachers should be more involved in student interaction and increase mutual understanding with students.

From the above we can know that the interactive classroom test method proposed in this paper can effectively improve initiative learning ability, deepen students' knowledge mastery, improve cooperative work ability and enhance sense of team competition. However, to successfully apply this method to classroom teaching, teachers must meet the following two basic conditions. (1) Teacher should familiarize themselves with the contents of the course and fully grasp the curriculum knowledge system. (2) Teachers should take the students in the module group as the unit to carry out question-and-answer and homework design in the class stage, in order to increase the ability of students to work together.

4. Conclusion

This paper proposed an interactive classroom test method based on the module thought. The main purpose of this method is to improve students' initiative learning ability and mutual help and cooperation ability. This method considers the interaction between teachers and students, and divides a large number of students into module groups to realize the small class management mode. Compared with the small class teaching mode, the advantages of this mode are mainly reflected in increasing the competition and mutual aid mechanism between the module groups, which can make students realize the importance of team cooperation and cultivate competitive consciousness.

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