Exploring of teaching effect of course “vehicle chassis structure” based on the teaching mode of divided class

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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. It is very important to strengthen the teaching effect of cases in the classroom. The course “Vehicle chassis structure” is a compulsory professional course for undergraduate students majoring in automotive engineering. This work has proposed a teaching mode of divided class for the course of “Vehicle chassis structure”. And it can be concluded that the teaching effect can be improved largely via the teaching mode of divided class. The main purpose of this method is to improve students' initiative learning ability and mutual help and cooperation ability.

Keywords: Teaching method; divided class; vehicle chassis structure; teaching effect

1. Introduction

"Divided class" is a new teaching model proposed by Prof. Zhang Xue-xin in Fudan University, which is an innovative project of classroom teaching. This new teaching mode makes a systematic change from "teaching-oriented" to "learning-oriented" in the classroom via adjusting the relationship between teaching and learning. The so-called "bisection class" is the teacher and students "in half" class time. But this kind of segmentation is not as simple as splitting a lesson into two parts, with teachers "teaching" in half the time and students "learning" in the other half. Compared with the traditional class, the key point of "divided class" is to stagger "teaching" and "discussion" for a period of time, so as to form clear separation three processes: presentation, internalization and assimilation, discussion. The process of "internalization and absorption" is arranged after class and marked by the completion of high-quality study work. In general, at the beginning of the unit, students have to "exchange and discussion" on the unit one end of the teacher "white space" content, which is the most significant feature of "divided class" teaching, so it is also known as "separated class discussion". The basic flow is shown in Fig. 1.

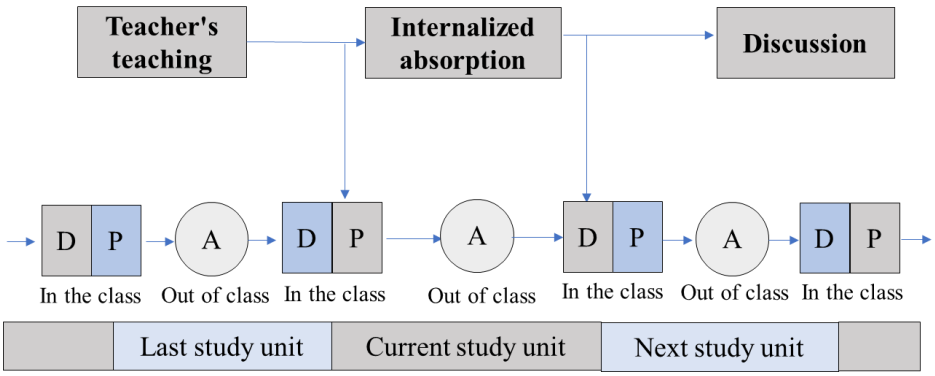

Fig. 1 The basic process of "interval discussion" in divided classes

2. Design and operation of the teaching mode of "divided class"

The course “Vehicle chassis structure” is a compulsory professional course for undergraduate students majoring in automotive engineering in Shanghai University of Engineering Science. There are various systems for the motor-vehicle chassis and much teaching emphasis needed to be mastered by the students. But there are still the similar learning methods to master these knowledges.

The object of this work is to design the teaching pattern of section of “transmission arrangement plan” in the course of "Vehicle chassis structure". On the basis of the existing teaching methods, means and examination methods, the teaching methods have been analyzed and improved. This teaching mode is uniformly arranged according to the three systems of "teacher's teaching + internalized absorption + discussion", and decomposed into six elements: "(teacher's teaching + literature supply) + (literature reading, report submission) + (student discussion + teacher-student discussion + optimal comment)".

(1) The teaching from teachers

The teacher explains one of the key transmission arrangement plan “Engine front-rear wheel drive” according to knowledge points set in advance.

(2) Literature supply

According to the chapter content, the teacher selects the representative literature about other transmission arrangement plans, except for “Engine front-rear wheel drive”, and then asks the students to read after class.

(3) Literature reading

This teaching process is completed by students after class. On the basis of the knowledge points about “Engine front-rear wheel drive” taught by the teacher, the students read the representative literature about other transmission arrangement plans. In order to avoid using translation software only, students are required to summarize the topics and main results of the literature, evaluate the advantages and disadvantages of other transmission arrangement plans. Through the literature reading, students can exercise their scientific research thinking ability and spirit, improve their ability to analyze, solve and find problems, and lay a solid foundation for their subsequent scientific research activities.

(4) Student discussion

In the discussion, 3-4 students can be set as one group. And the students can discuss about their own perspective and understanding about the transmission arrangement plans, which can not only improve their cognition of the literature, but also improve the enthusiasm of students in the process of eliminating doubts by themselves through mutual inspiration and promotion. At the same time, students in the discussion can exercise the ability of expression and critical thinking, learn to learn from the perspective of others, students to enhance understanding and deepen friendship. The teacher observed the participation of each student in the class and made corresponding records as the basis for the usual performance. It should be noted that the teacher should set the testing standard and the score distribution in advance for the performance difference between "group" and "individual" in the discussion process.

(5) Teacher-student discussion

The teacher can join with the students and answer the problems of the students, and a student spoke on behalf of the group to summarize the literature and analyze the problems. The teacher comments on the students' summary, answers the difficult questions, shares the scientific research thinking ability and spirit reflected in the literature with the students, summarizes the scientific research methods, carries on the scientific spirit education to the students, cultivates the students' scientific attitude, lays the foundation for the students' future scientific research life.

(6) Optimal comment

After the discussion, the teacher presents and comments on the excellent reading report, expounds the reasons for the excellence and points out the existing problems, which can help the students learn to fill in the gaps and make up for their own shortcomings with their own strengths, so that they can make continuous progress in the process of learning.

The basic flow is shown in Fig. 2.

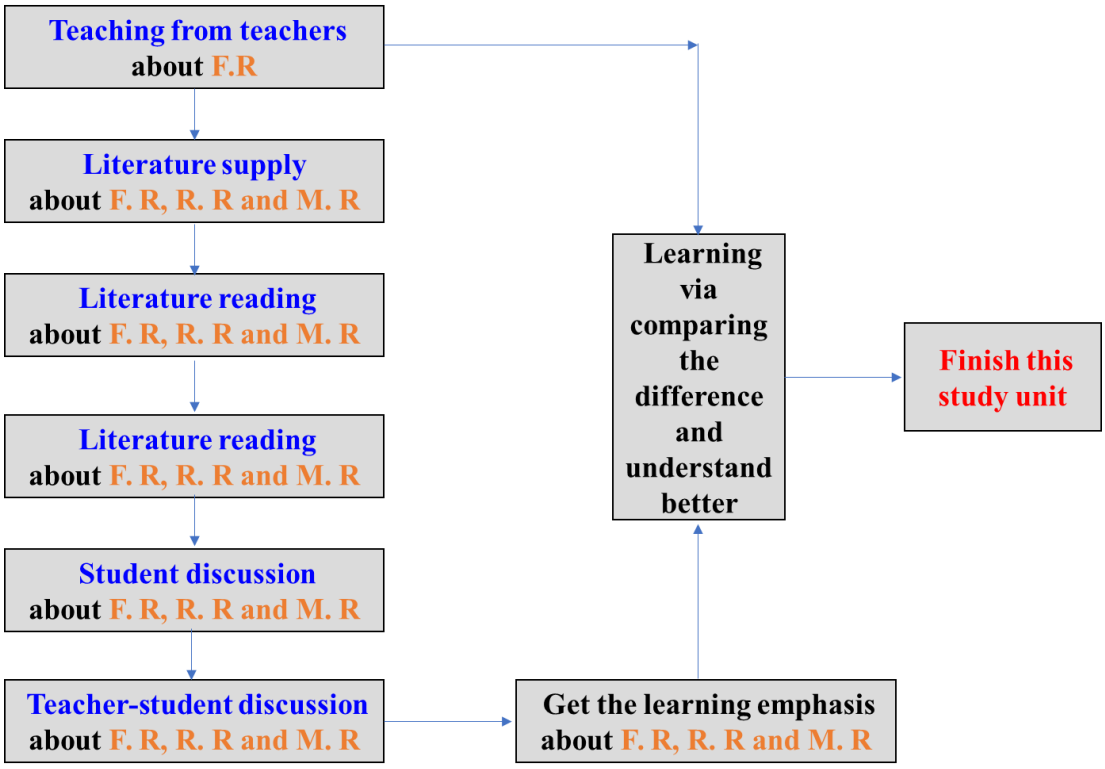

Fig. 2 The studying process of divided classes for "transmission arrangement plan" in the course of "Vehicle chassis structure"

3. Methods practice and results

Seen in Table 1, it is worth noting that via the teaching mode of divided class, the students can grasp and apply knowledge better. This is result from the students can enhance the understanding of the knowledge points through the exercising the ability of expression and critical thinking.

Table 1 The teaching effect of the course "vehicle chassis structure" course based on the teaching mode of divided class

Course	Understanding of the knowledge	Memory of the knowledge	Application of the knowledge	The final exam
Vehicle chassis structure	Improved	Improved	Improved	Improved

4. Conclusions

This paper proposed a teaching mode of divided class for the course of "Vehicle chassis structure". 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. The advantages of this mode are mainly reflected in increasing the competition and mutual aid mechanism between the groups, which can make students realize the importance of team cooperation and cultivate competitive consciousness.

5. Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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