

Flipped Classroom Instructional Design Based on Online Courses

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Abstract—As a net generation group, post-00s college students have the distinct characteristics of broad knowledge, strong network application technology and high personalized learning requirements. To some extent, traditional teaching design cannot meet the improvement of post-00s college students' knowledge acceptance ability and comprehensive quality. Online courses and flipped classes have become the mainstream mode of current network-based teaching. To a certain extent, they have increased students' interest in learning and realized independent and individualized learning. However, this mode cannot be uniform. It is necessary to study in depth the group characteristics, behavior habits and ways of thinking of students of different majors. Targeted teaching design and reform, this paper takes Automobile Structure II as an example to introduce the characteristics of students in this major in detail, and combs the key points of online course design, focusing on the teaching design of flip course, in order to provide reference for the practice of flip course teaching based on online course.

Keywords—Online course; flipped classroom; instructional design; blended teaching

I. INTRODUCTION

The Outline of National Medium and Long Term Educational Reform and Development Planning (2010-2020) points out that the core of persisting in people-oriented education and promoting quality education is to solve the major problems of cultivating who and how to cultivate people. The emphasis is to promote the all-round development of college students based on the characteristics of current college students' groups and to focus on improving their social responsibilities. Currently, sense of responsibility, innovation and practice ability [1], most of the higher education adopt the "cramming" teaching mode, which is teacher-centered and textbook-based. The teaching means are single, the degree of teaching innovation is not high, the students are in the position of passive learning, the interest and enthusiasm of learning are not high, which leads to the low ability of self-learning and seriously affects the students' subjective initiative. [2], hindering the cultivation of students' ability to explore and innovate, obviously the traditional teaching methods cannot adapt to modern education and teaching components, incorporating the applicable criteria that follow.

With the rapid development of the network information society, the application of modern information technology in teaching is becoming more and more widespread. The construction and application of online courses has become an important way for the current reform of higher education and teaching. Each university has carried out information-based teaching practice supported by MOOC, SPOC and various online course platforms. Teachers have extensively explored new forms of teaching application, whether by means of open online courses or by building their own private online courses. Moreover, with the deepening of practice and deep reflection on online teaching and rational regression, it is also a realistic choice of higher education teaching mode.

Based on this, this paper combines online courses with flipped classes, draws on their strengths and weaknesses, reconstructs the existing teaching model and design, supplements and develops the application of flipped classes in teaching practice, and strives to provide a new method for the teaching reform of this major; in practice, through the teaching design of "Automobile Structure II", timely delivery Current problems, revised teaching methods and designs are aimed at improving the teaching effect and cultivating students' comprehensive qualities such as initiative thinking, innovation and teamwork.

II. CURRENT SITUATION OF "AUTOMOBILE STRUCTURE II"

The main teaching mode of "Automobile Construction II" is the traditional face-to-face teaching mode, that is, multimedia courseware is the main part, and the black-board writing is the supplement. Teachers adopt the traditional teaching mode to interact with students in the form of questions, guidance and inspiration, so as to deepen students' understanding of knowledge. This method conforms to the theoretical teaching mode of University classroom. However, with the rapid development of network and information technology, as well as the changing characteristics of student groups, it is obviously not conducive to the efficient transmission and acceptance of knowledge to continue to adopt the previous teaching model. The main problems of traditional teaching mode are: relatively single teaching method, relatively fixed teaching mode, low degree of interaction and communication among students, less active learning

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phenomenon, low interest in learning, poor teaching feedback effect and so on.

At present, the main force of college students is the post-95 and Post-00 groups, which are known as the "Internet generation". They have the characteristics of distinct personality, strong creativity, high level of network application and fast knowledge acceptance. The traditional face-to-face classroom teaching mode cannot fully meet the needs of learning requirements of the new generation of college students for individualization and networking.

Based on the above problems, this paper puts forward the teaching design of flipped classroom based on online courses, which changes the process of knowledge imparting from face-to-face teacher teaching to online self-learning, and the process of knowledge understanding and internalization into classroom report exchange and discussion, under the guidance of teachers' key and difficult points. The consolidation process has been completed in the form of network operations and virtual experiments. This new teaching mode can greatly enhance the interest and initiative in learning and improve the ability of innovation.

III. FLIPPED CLASSROOM DESIGN BASED ON ONLINE COURSES

Based on the analysis of the current situation of the above-mentioned courses, the advantages and disadvantages of the current teaching mode are deeply analyzed. Through active interviews and peer exchanges, the study needs and common personality characteristics of the students of this major are discussed. During the second semester of the 2017-2018 academic year, the group characteristics of the students of the vehicle engineering major in the grades of 2015, 2016 and 2017 are analyzed. From the following five dimensions: 1) online curriculum technology dimension, mainly refers to teaching platform and professional technical support; 2) flipping curriculum design dimension, mainly including teaching content, curriculum flexibility, course teaching quality, interactive communication, teaching evaluation and other factors; 3) guiding scholars dimension, mainly including teachers' teaching guidance mode and practice. (4) learner dimension, mainly including learning motivation, learning habits, autonomous learning ability, knowledge level and other factors; (5) interactive dimension, mainly including online interactive mixed learning exchanges, offline teacher-student interaction, classmate interaction. After repeatedly discussing, arguing and summarizing the advantages and disadvantages of traditional teaching methods and Flipped classroom teaching methods, the overall scheme of Flipped classroom based on online courses is designed, as shown in Fig. 1.

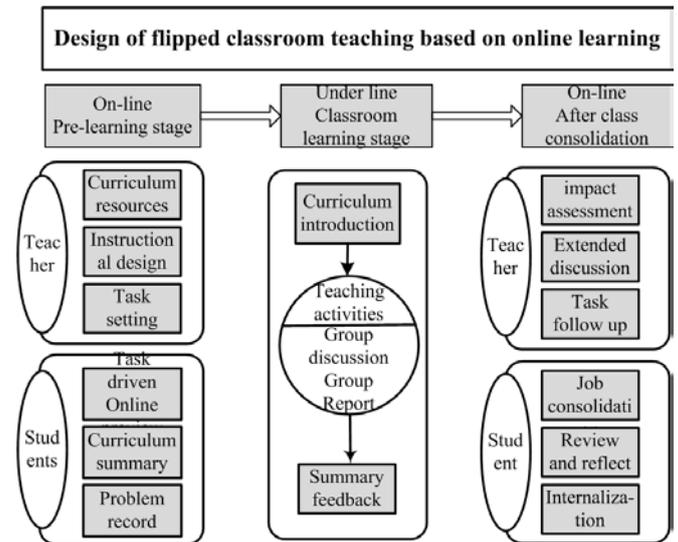


Fig. 1. Design of flipped classroom teaching based on online learning

The flipped classroom is divided into three stages: online preview stage, offline classroom learning stage and online consolidation stage. These three stages are complementary and harmonious in the process of learning.

A. Pre-Learning Stage

Before class, teachers make learning tasks and questions according to the feedback of teaching information and students' level and transmit them to the network teaching platform. The learning contents mainly include multimedia courseware, video, animation and so on. They are delivered one week in advance. Through the network teaching platform, they can learn the content of the network course independently, answer questions and encounter problems. Difficult questions consult group members; strive to solve problems encountered in self-learning. The group cannot answer the unified feedback to the network teaching platform. According to students' feedback, teachers should revise the teaching contents, revise the teaching objectives, and make good preparations for teaching [4].

B. Classroom Learning Stage

In face-to-face classroom teaching, teachers randomly inspect students' learning situation to grasp the learning progress and knowledge mastery, raise students' feedback questions, set up discussion content, re-grouping, and carry out inquiry-based learning collaboration.

After completing the basic learning of the corresponding knowledge points, learners enter the process of sorting out and summarizing analysis, and complete group learning activities through guiding training, group generation, case analysis, knowledge assessment, report and evaluation.

Finally, each group will send representatives to show the results of the discussion. Members of the group can make supplementary explanations accordingly. Other groups can ask questions or express different opinions. Every student is encouraged to share their learning results and report on their achievements.

To promote the internalization of students' professional knowledge and exercise self-confidence, language expression and logical thinking ability, teachers play a leading role in this stage, guiding students to think, timely guide and impart knowledge, counseling the inquiry process, in order to prevent the discussion from deviating from the theme, to ensure the smooth development of the learning process and achieve the desired learning effect.

C. After School Communication Phase

After class, teachers take the initiative to interview students, understand their evaluation of the learning process, timely reflect and summarize the whole teaching process, including the pre-class learning stage, students' network feedback, the design of learning process in class and students' performance and thinking ability, etc. After reflection and summary, they prepare for the next section of the student process.

The characteristics of this teaching method are that teachers set up problems and learning content, so that students can complete their learning tasks in the form of independent inquiry or group cooperation through various learning resources, so as to give full play to students' learning initiative and enthusiasm. Learning autonomy or group completes the screening, screening, induction and summary of learning materials, and constructs and reconstructs conscious knowledge system so as to better understand and master knowledge. The design concept is based on the problem, in the form of task-driven and inquiry-based learning, to provide students with a platform for autonomous learning and teamwork, in order to master the learning skills of active thinking and active learning.

IV. CONCLUSION

With the deepening of education and teaching reform and the advancement of network technology, online courses and flipped classes have become the main development direction of teaching reform in Colleges and universities. Based on a

comprehensive analysis of the characteristics of the students' group and the advantages and disadvantages of traditional and modern teaching methods, this paper takes Automobile Construction II as an example, puts forward a teaching method of flipping classroom based on online course, and designs a teaching design scheme, with a view to providing theoretical reference for flipping classroom teaching practice and teaching activity design. Although many provinces and municipalities have begun to try online courses and flip classes, there are still many problems worthy of further study, such as the implementation method of online learning, the guiding teaching of flip classes, group discussion and reporting effect, etc.

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