

Design and Practice of Online Course Teaching Based on Inquiry Learning

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Abstract—In order to deepen the education and teaching reform of automobile detection and experiment course, this paper carries out the research and practice of online classroom practices teaching, reconstructs the existing teaching mode and design, supplements and develops the application of online classroom in teaching practice, and strives to provide a new method for the teaching reform of vehicle major. Meantime, this online teaching method is practiced in "Automobile Detection and Experiment" course, to verify its advance and practicability. Discovery of questions and revision of teaching methods and designs are timely aimed at improving teaching effect and cultivating students' comprehensive qualities such as initiative thinking, innovative ability and teamwork ability. This online classroom teaching modes can also be applicable in other classes.

Keywords—Online learning; Teaching reform; Autonomous Learning; Group discussion.

I. INTRODUCTION

Guo Shuting[1] and Hu Yongbin[2] respectively discussed the meaning and structure of learning experience in online learning environment and intelligent learning environment, based on the analysis of learning experience. While Liu Bin and others further[3] explored the connotation, occurrence mechanism and influencing factors of learning experience in online courses. According to the analysis, online curriculum learning experience has two connotations: cognitive process and emotional experience. Its structure includes three dimensions: curriculum environment experience, learning activity experience, learning effect perception and evaluation. Its development process and psychological mechanism can be simplified into three levels: environment perception, activity experience, effect evaluation and value judgment section. In view of the current situation of online course learning experience, Veletsianos and others [4], Zutshi and so on [5], He Chun and so on [6], Wu Xiaomeng and so on [7] have carried out relevant research. They have conducted interviews, questionnaires and learning log analysis, respectively, from the online course environment perception, resource utilization, learning interaction, participation feeling, etc. Learner's online learning experience is analyzed in terms of learning willingness, satisfaction and curriculum performance.

In 2007, videos of PPT and voice were taught to help students who did not come to class by Jon Bergmann and Aaron Sams. Eric Mazu used the flipped and online classroom

teaching mode to carry out practice in Harvard classroom. Stanford University puts the teaching videos on the Internet, and students are free to choose the learning time [8]. At the same time, we should set up corresponding questions every 15 minutes to understand the learning effects of students. By adding social discussion and communication area to improve learning interest and learning effect, the teaching model has achieved good results. The California Riverside United School District [9, 10] has developed a digital interactive textbook, which has powerful multimedia functions, such as sharing, note-taking, animation and video. Primary and secondary schools in the United States have implemented the flip classroom teaching model, students' failure rate has decreased, students' participation in the classroom has greatly improved, self-confidence has increased, and violations of discipline have decreased accordingly.

In terms of the above mentioned, through the combination of inquiry learning and online classroom, this paper reconstructs the existing teaching mode and design, supplements and develops the application of online classroom in teaching practice, and strives to provide a new method for the teaching reform of this major; in practice, through the teaching practice of "Automobile Detection and Experiment" course, timely discovery of questions and revision of teaching methods and designs are aimed at improving teaching effect and cultivating students' comprehensive qualities such as initiative thinking, innovative ability and teamwork ability.

II. STATUS OF AUTOMOBILE TESTING AND TESTING COURSE

College students have more affluent extra-curricular learning time than primary and secondary school students, which coincides with the flexible and autonomous online learning form of online classroom. On the one hand, students' enthusiasm for free learning is fully mobilized. On the other hand, the feasibility of developing online classroom in university classroom is relatively high.

III. CONSTRUCTION OF VEHICLE DETECTION AND EXPERIMENT TEACHING MODEL

A. Practical teaching model

Starting from the reality of practical teaching, the model is divided into three parts: extracurricular online learning stage,

classroom group discussion stage and after-class induction and summary. Before class, we should pay attention to the cultivation of students' self-study ability, guide them to arrange their learning plans reasonably, and promote the independent absorption of teaching content. At the same time, in the classroom, teachers, as classroom guiders, learning helpers and task setters, guide students to think deeply and explore problems actively, stimulate students' potential to solve difficulties independently, work in time after class, summarize feedback, and attach importance to process and teamwork.

B. Design scientific and reasonable teaching plan

Before carrying out online classroom, we must design teaching objectives, teaching content, teaching activities, evaluation system, etc. [5]. The specific design is as follows:

(1) Revision of practical teaching objectives for students of this major.

Considering the characteristics of the students in this major, the practical teaching of automobile detection and diagnosis technology requires learners to master basic theoretical knowledge, principles, basic methods and skills, and revises the practical teaching objectives from three aspects: theoretical knowledge, practical ability and teamwork.

(2) Track the frontier of scientific and technological development, optimize and update the contents of practical courses.

Streamlining the content of practice, deleting outdated technology, paying attention to practical teaching, keeping up with the development of automobile science and technology, timely and reasonable updating of teaching content.

(3) Design of flip classroom practice teaching activities

Teachers should encourage students to design and develop independently by assigning tasks, learn by doing, and provide opportunities for students to acquire direct learning experience by presenting group works, debating contests and brainstorming.

(4) Establish a scientific and rational evaluation system.

According to the teaching objectives and requirements, we should fully consider the level of students at different levels and carry out hierarchical evaluation. The evaluation system can be divided into teacher evaluation, group evaluation and online evaluation. Strive to give every student the most fair and reasonable evaluation.

C. Developing large capacity network teaching resources

In the existing network teaching platform, the module of "Practice Teaching Online Classroom" is set up separately, and the teaching contents, assignments and test questions are formulated according to the practical knowledge points, and the materials such as micro-videos, micro-courseware and exercise questions are uploaded, tested and applied. As shown in Fig. 1.

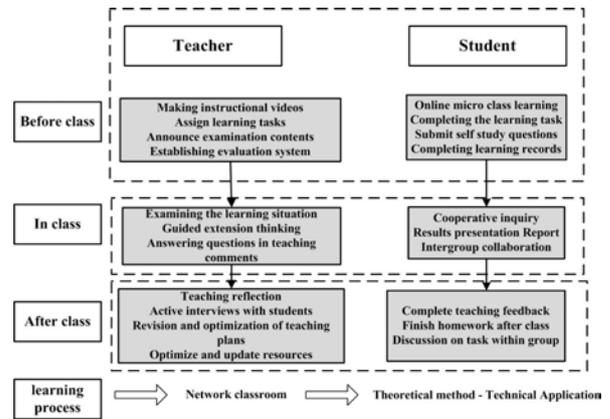


Fig. 1. Design of the online learning.

IV. IMPLEMENTATION OF ONLINE CLASSROOM PRACTICE TEACHING

Using the above-mentioned "online classroom" network learning platform, teaching experiment is carried out in the teaching process of grade 15 vehicle engineering specialty. Practice course teaching is divided into online learning stage, face-to-face classroom teaching stage and independent learning stage, as shown in Fig. 2.

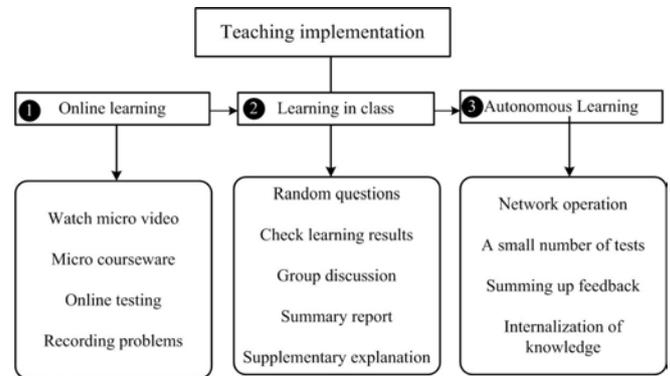


Fig. 2. Teaching implementation.

Currently, there are some problems in experimental teaching, such as low utilization of resources, unsatisfactory pre-class preparation, less practical class hours and poor learning effect. Online classes with pre-class online learning and after-class discussion and summary form are adopted, taking into account the advantages of various teaching methods, thus providing students with different learning styles with appropriate conditions. Learning mode has improved its efficiency in mastering knowledge and skills, and achieved better results in learning. Teachers can also get feedback information and deal with information in time after carrying out research and exploration in online classroom. Timely revision of lesson plans and courseware, constantly try to understand students' learning needs and improve their teaching level.

V. CONCLUSIONS

Practical results show that the online classroom has achieved good results in the practical teaching of automobile detection and diagnosis technology. It is mainly reflected in:

(1) Make full use of the rich extracurricular learning time of university students. College students have more extra-curricular learning time, and can flexibly arrange learning plans. College students' learning should be mainly self-study, so that students can get better development in seminar teaching and extra-curricular learning.

(2) Arrange online learning time freely and mobilize students' enthusiasm for autonomous learning effectively. Online learning respects the learning habits and characteristics of different students. It can arrange learning at anytime and anywhere. It can also select appropriate learning materials to fully reflect the autonomy of learning.

(3) Increase teacher-student interaction, pay attention to the main role of students, and learn happily. Traditional teaching, teachers keep repeating, students are passive learning and memorizing, students often feel exhausted, learning subjective initiative is not enough, the phenomenon of playing mobile phones in class is more common, online classroom is a research-based teaching, teachers as a guide, guide students to participate actively, teachers and students interact more, learning.

(4) Feedback and summarization timely to effectively enhance the teaching professional level of Teachers

(5) To solve previous teaching problems and combine various teaching methods to complement each other's strengths and weaknesses

(6) Online classroom teaching methods are similar and applicable in other classes.

ACKNOWLEDGMENT

This work was supported in part by the Science and technology plan of Shandong higher education institutions (Grant No. J18kA012). and Education and teaching reform project of Weifang University (Grant No. 2016XJ018).

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