Study on the Construction of Online Open Course of Automobile Theory

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Abstract—**Online open course is a product of the Internet age and a new way to cultivate students' independent learning ability. According to the construction situation and professional characteristics of the online open course of Automobile Theory, the construction goals and ideas of the online open course is analyzed, and the construction process of the online open course is focused on from the aspects of construction content. The online open course can provide teaching resources for carrying out online and offline mixed teaching. The construction of the online open course of automobile theory has certain reference significance for the construction of open online courses in local colleges and universities.**

Keywords—Online open course; Automobile theory; Teaching design; Teaching resources

I. INTRODUCTION

The course construction is an important way for colleges to improve teaching quality, and is an important part of teaching reform. High-level course is the basis for ensuring the cultivation of high-quality talents. In the current era of rapid development of information technology, the pattern of "Internet +" has profoundly affected the teaching in colleges and universities, especially the course construction.

The massive open online course, MOOC, has been developed since 2007. In 2012, the top universities in the United States set up online learning platforms and offered free courses online, providing more students with the possibility of systematic learning. In just ten years, MOOC has aroused widespread concern in the education circles worldwide, triggering a reform of the learning model, and bringing great challenges and opportunities to the global higher education field.

The MOOC integrates and shares the high-quality higher education resources, making the teaching direction change from one-way to interactive, and it has become a revolutionary new teaching method that changes the traditional classroom

education [1]. The online course is very convenient and flexible, which makes students move from passive learning to active learning [2].

It has several main advantages as follows: expand the time and space restrictions in student learning, improve the utilization efficiency of excellent teaching resources, facilitate the communication and interaction between students and teacher, and promote the exchange of teachers' teaching ideas and the improvement of teaching level [3].

After the online course is completed and used, the combination of online learning and classroom teaching can be realized, which can definitely improve the learning efficiency of learners [4].

Automobile Theory is one of the important professional courses in the vehicle engineering profession. It is also a compulsory course for other automobile-related majors. It has features with a wide range of knowledge, a large benefit range for student, close combination of theory and practice. The course is one of the important teaching links to cultivate students' professional quality, practical ability and innovative consciousness.

In order to deepen teaching reform, improve the level of course construction, promote the transformation of education and teaching concepts, lead the reform of teaching methods, promote the sharing of high-quality resources, cultivate students'' independent learning ability, and improve the quality of personnel training, taking the course of Automobile Theory as an example, the research and practice of online course construction is carried out. Constructing a teacher-led, student-centered teaching relationship provides students with active and creative digital learning environment.

II. THOUGHTS OF THE ONLINE OPEN COURSE CONSTRUCTION

A. Objective of course construction

Automobile Theory is a course with strong practicality and wide application range, and it has many basic concepts and theories. In the case of limited class time, teachers often cannot explain all the knowledge points in depth. Therefore, how to apply modern information technology to the classroom teaching of automobile theory based on the course characteristics, it is a problem to continuously improve the quality and efficiency of teaching that teachers have been exploring.

In order to enable students to better understand the course content, enhance learning enthusiasm, improve self-learning ability, and improve teaching level, based on the course characteristics, the teaching content and teaching methods of course are reformed.

The construction of the online course of automobile theory is to enable the integration of network information technology and teaching, and to explore advanced classroom teaching methods.

The objectives of the online open course construction include: building an open platform for the course, updating teaching content, continuously improving various teaching resources, and establishing an interactive platform.

The goal of objectives course is to strengthen the high-quality teaching, so that students have a wealth of theoretical knowledge and professional practical ability.

B. Thoughts of course construction

The Online Open Course is designed to make it easy for learners to learn regardless of time or place. The learners may only have a few minutes or ten minutes of fragmentation time. The fragmentation of time leads to fragmentation of learning. Then, it is necessary to think the course content, and clearly define the course construction thought, that is, clearing the lecture target, clarifying the course orientation, clarifying the teaching model, clarifying the teaching objectives, and clarifying the evaluation of learning effect, etc. The modularization and fragmentation of the course contents can meet the learners' need for convenient and fast learning [5].

1) Teaching object
The learners give first place to college students, and some of them are social learners.

2) Course orientation
The online course is used for teaching reform and actual application.

3) Teaching form
The video is short and refined, which is convenient for anytime and anywhere to provide convenience for students.

4) Teaching objectives
The learning objectives of teaching units and knowledge points are clear.

5) Teaching effects
Teaching effects can be tested by online homework, online test, online comprehensive test, and so on.

The specific construction ideas of the online open course of Automobile Theory are given as follows.

1) Emphasize interactive teaching
It is necessary to give full play to the role of the Automobile Theory course and create a multilateral interactive teaching environment. The teachers can adopt heuristics, case teaching, discussion modules, and other teaching methods, so that students can stimulate their initiative through point of view collision and integration, to meet the multi-level, multi-type learning needs of students.

2) Improve extracurricular learning system and deepen the breadth and depth of teaching resources
In order to better help students' complete online learning tasks, it is necessary to pay attention to the breadth and depth of teaching resources. Therefore, the course platform should provide a variety of learning resources are provided [6].

3) Improve organizational structure
The different sub-course modules are independent and cross-cutting. They are easy to learn separately and have a main line to form an intelligent and open platform integrating teaching, assessment and evaluation.

4) Focus on the combination of online and offline
Before the start of the course, the teacher analyzes the students' characteristics, such as the grade, majors, follow-up courses, etc., and provides course descriptions, syllabus, implementation rules, assessment plans, and so on. Students study online, most of the problems are solved through online communication, and individual common problems are solved through classroom learning.

5) Reasonably arrange pre-class and in-class teaching to effectively improve students' learning efficiency
In order to supervise the students to complete self-study in a timely manner, the teachers should send a supervision information to the students every week. In addition, because the acquired knowledge by students is often fragmented, the teachers can help students systematically construct fragmented knowledge through graphical methods in classes.

III. CONSTRUCTION PROCESS OF ONLINE OPEN COURSE

The construction of the online open course are usually planned and realized from the aspects of course content, learning resources, teaching organization, and evaluation feedback. In order to better achieve the goal of course construction, it is necessary to clarify the main position of students in the course of learning [7].

A. Platform selection

To build an online open course, the platform is indispensable. Before building a course, it is need to consider the platform's professional technical capabilities, the storage and playback capabilities of network server and background data processing capabilities. It is also necessary to consider the

impact of various aspects, such as visibility, academic recognition, teacher level, appeal and the source of learners.

In many excellent platforms, after comprehensive analysis and comparison, the Zhihuishu online education platform is finally selected.

The platform is committed to achieve the informatization and internet of the education, and it adopts the "platform + content + service" trinity model to help teachers build new courses and achieve reform of teaching methods.

B. Team formation

The construction team of online open course must not only have professional teachers, but also absorb certain professional course designers and resource producers. The course building team consists of production group and teacher group.

The entire team members must not only have strong technical skills, love teaching, work hard, but also be good at communication and willing to cooperate. During the preparation period, the teacher should make a clear division of labor for the teacher group.

C. Organization and decomposition of teaching content

According to the professional syllabus and course standards, the content of the course is determined, the knowledge points are sorted and fragmented, and a series of theoretical teaching and practical guidance micro-courses are produced, which are convenient for online and offline use.

According to the course system, the teaching content of Automobile Theory is divided into seven units, each unit is divided into several knowledge points, and one micro video is recorded for each 1-2 knowledge points. For example, the third unit should have five micro videos, as shown in Table 1.

TABLE I   MICRO VIDEO RECORDING PLAN FOR SELECTION OF AUTOMOBILE POWER PLANT PARAMETERS

Chapter	Main content	Teaching micro video
Selection of automobile power plant parameters	Selection of engine power Selection of the minimum gear ratio Selection of the maximum gear ratio Selection of transmission system number and gear ratio of each gear	Selection of engine power The choice of the minimum gear ratio Selection of the maximum gear ratio Selection of the number of transmission systems Selection of gear ratio of each gear

D. Design of learning resource

The resources of the online course mainly include two parts, the online learning resource and he meeting class learning resource. The online resource mainly include videos, bombings, test questions, discussion questions, assignments, and test papers, which are based on knowledge points, mainly guiding students to achieve independent learning.

The main purpose of offline class resources is to help students internalize knowledge and test learning effects, including textbooks, reference materials, multimedia

courseware, lesson plans, learning tasks, and meeting classes' activities, and so on.

E. Design and organization of teaching activities

The teaching resources of online open courses are based on basic knowledge and comprehension knowledge. In order to avoid students' learning burnout, it is necessary to design some interactive activities that are convenient for students to participate, so as to improve their participation in the course.

In the process of organizing teaching content and teaching resources, the teachers must clarify the subject status of students, and change from knowledge interpreters to designers and guides of knowledge.

The online real-time communication can provide communication channels for teachers and students, while offline teaching focuses on seminars, broadening the scope of activities of teachers and students, and strengthening the effectiveness of online learning. Students learn the key points of knowledge and skills through online self-learning. The teachers and students then deeply interact with the key and difficult content of the knowledge points in offline process, inspiring students to think actively and cultivate students' logical thinking ability.

F. Implementation and feedback of teaching evaluation

The evaluation system of the online open course should comprehensively evaluate students' learning process, learning ability, enthusiasm and application innovation. The evaluation system includes online and offline subsystem.

The online part should assess the teaching effect according to interaction, knowledge review test, learning record, and online activity participation.

The offline part focuses on the application innovation ability of knowledge and interaction with teachers and students, and the flexibility degree of knowledge understanding and applying. The evaluation results should be promptly reported to the students to guide them to adjust the online learning strategies in a timely manner.

IV.   CONCLUSION

For the teachers, especially the teachers of local colleges and universities, the process of building an online open course is a time-consuming and laborious task, but it is also a process of improving the level of teaching. After the online open course is open to learners, it is necessary to build the course continually. It can be said that the course content should be continuously supplemented, enriched and improved. For the students, learning through the online open course is a process of cultivating their independent learning ability, which is very beneficial for improving their learning effect. The construction of the online open course is of great benefit to improving the quality of the course teaching. The construction effect of the online open course needs to be improved.

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