

The Construction and Practice of Online and Offline Mixed “Gold Course” -- Taking the Course “under Automobile Construction” as an Example

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Abstract: According to the advanced and innovative teaching requirements proposed under the new engineering background, the construction of the “golden course” of online and offline education needs to consider the construction of online resources, the improvement measures of offline teaching, and how to “mix” online and offline education. The course “Under Automobile Structure” of Hunan University of Communications Engineering adopts the mixed online and offline teaching method, and uses the Superstar platform as the online platform. The course construction plan and implementation process are given. The practice shows that the curriculum construction has a remarkable effect on the reconstruction of knowledge system, the transformation of learning subjects, and the cultivation of engineering application ability, which plays a good demonstration role in the universities in the province.

1. Introduction

In June 2018, the Ministry of Education held a national conference on undergraduate education in the new era, at which the concept of “gold course” was put forward for the first time, pointing out that the difficulty and depth of undergraduate courses should be increased reasonably, and “water course” should be turned into a course with depth, difficulty and challenge. In October 2019, Jiaokao [2019] No. 8 “Implementation Opinions of the Ministry of Education on the Construction of First-Class Undergraduate Courses” put forward the standard of “one degree for both sexes” and implemented the “Double Ten Thousand Plan” for first-class undergraduate courses. The proposal of “golden lesson” conforms to the current educational situation, so that students can truly learn knowledge and skills, and be better accepted by the society. The models of “golden lesson” include offline, online and a combination of online and offline. Online hybrid “gold” means based on online courses, using the appropriate digital teaching tools, combined with the circumstance of the school curriculum reform, the organic combination of online autonomous learning and offline face-to-face flip classroom, hybrid teaching, build online courses and the integration of the school classroom teaching of hybrid “gold”.

2. Objectives of Curriculum Construction

“Under the Structure of Automobile” is the professional core basic course for undergraduate vehicle engineering major, automotive service engineering major, and junior college vehicle inspection and maintenance major. It has strong engineering and practicality, and is a “bridging course” between basic courses and professional courses. The importance of the course is a consensus among students. As a provincial undergraduate university, our position is “research-oriented”^[2]. A focal point of course construction is how to cultivate the students' car research and development of engineering application ability, make students have the basic quality of automotive engineers, spread this goal in the whole online teaching activity, including: the improvement of the online resources, each chapter of teaching design, use of modern simulation tools, and so on^[3-4].

3. Curriculum Construction Plan

According to the connotation of online and offline mixed “golden course”, the following problems need to be solved in the course construction of “Under Automobile Construction” : (1) How to make the deep integration of theory and practice, and cultivate students' engineering application ability and innovation ability; (2) How to build the knowledge system of the course so that online and offline teaching can be effectively connected; (3) how to change the learning subject to achieve deep two-way interaction between teaching and learning; (4) How to integrate ideological and political elements into the entry point for value guidance.

3.1 Platform Resource Construction

The platform resource used in the hybrid teaching is the super star course “Under the Structure of Automobile” established by our school, which is online on the super star website. <https://mooc1.chaoxing.com/mycourse/teachercourse?moocId=216349621&clazzid=36331139&ut=t&enc=bc62324766fb5299ad1d2214e835507c&cpi=139656082&openc=39b8b2f0767eed15312a60fc0dd39261>, curriculum resources for provincial undergraduate college, emphasize the application of course, to carry out online hybrid teaching in the course provides a powerful guarantee. This course is also a high-quality course construction course in Hunan Province. In order to adapt to the online learning characteristics and regularity, line on line study seamless docking, from the perspective of learners, the chapter limits, in the form of “mind map” comb knowledge context, already achieved the fragmentation of knowledge organization, and has realized “the knowledge network link”, thus forming a complete system of knowledge. With the core content “how to amplify the small signal well” as the main line, to do “scattered but not chaotic”. Based on the super star platform, there are knowledge guidance, mind mapping, lecture videos, PPT courseware, knowledge notes, homework, after-class testing, comprehensive testing, key and difficult points analysis, knowledge expansion, discussion area and so on. “Engineering ability cultivation” is embodied in every module of resource construction.

3.2 Curriculum Construction Plan

The mixed-online and offline first-class courses require the use of appropriate digital teaching tools and the transformation of on-campus courses according to the actual situation of the school. Students should arrange 20% to 50% of the teaching time for online independent learning and organically combine with offline classroom face-to-face teaching to carry out blended teaching. The theoretical teaching of this course is 48 hours, and there are 16 hours of experimental lessons, and the experiments are independently designed. The 48 hours of theory courses are divided into 28 hours of concentrated teaching and 10 hours of self-study. Most of the content is memorized, not strong in logical analysis and derivation, and is related to real life. Students can achieve the teaching purpose through online self-study or in-class discussion. 10 hours for extended class discussion, mainly on engineering practical topics. The course contents and specific teaching forms are shown in Table 1.

4. Implementation Process

This course implements the online and offline mixed teaching mode, and the whole teaching process will effectively connect the three stages (pre-class preview, in-class internalization, after-class consolidation). Teachers use a variety of teaching methods to complement each other, such as problem-oriented method, task-driven method, case teaching method, discussion teaching method, simulation method, etc. Students use a variety of learning methods to infiltrate each other, such as the combination of learning and thinking, induction and summary, participation and interaction, cooperative learning, learning and application. Both online and offline test channels are closely coordinated to guide students to “independent and discussion” learning with an output-oriented approach. The instructional design framework is shown in Figure 1.

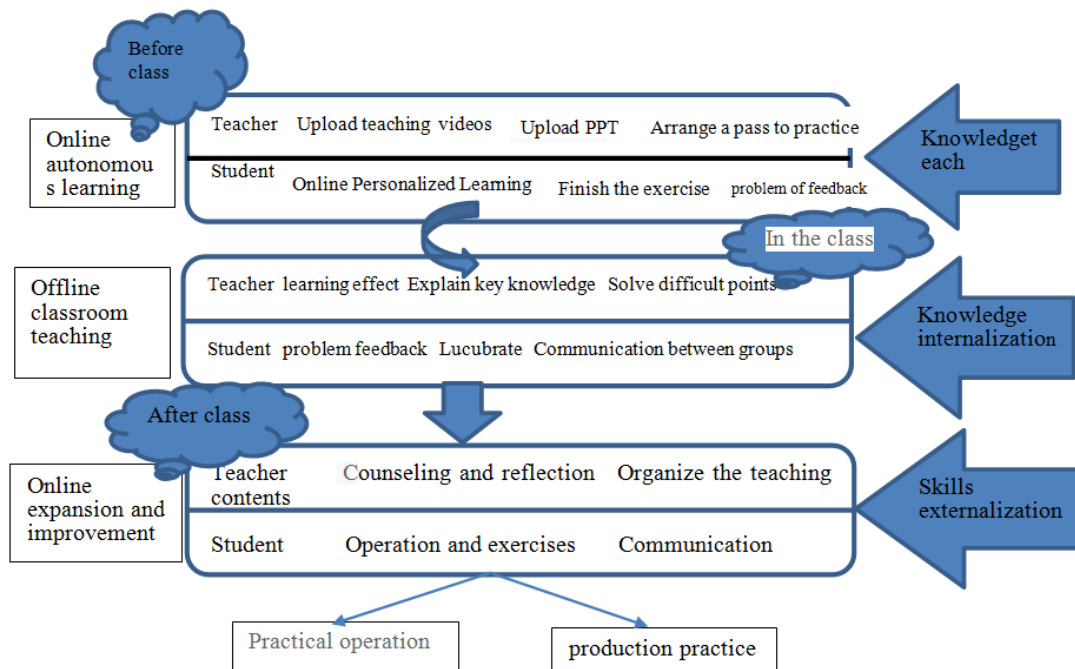


Fig.1 Based on the Implementation Framework of the Online and Offline Mixed Teaching Mode of Superstar Platform “Automobile Construction (I)”

The organization of the teaching content should emphasize the design ideas, structural principle analysis, and the problems that should be considered in the engineering of various parts and components and the design application skills. Strengthen the understanding of key concepts with thinking questions; Combined with homework and case training, cultivate students' engineering application ability; Then, through extended reading, students can understand the latest development trends. In the process of implementation, some details must be handled properly, otherwise it is difficult to ensure the effect of online teaching. Preview time before class should not be too long and should be controlled within 1 hour. Teachers should be involved. During the class period, teachers should be arranged to answer questions online and the feedback of questions should not exceed 24 hours. Classroom teaching is divided into four parts: sign-in, preview inspection and feedback, teacher's solution and discussion, and extended teaching. Time schedules are approximately 1 minute, 20 minutes, 24 minutes and 45 minutes. The focus of teaching is “knowledge frame, key and difficult points, and commonness. In order to strengthen the interaction between teachers and students and students, teachers should skillfully use intelligent APP tools, take advantage of the characteristics of students' interest in mobile phones, sign in, discuss, answer quickly, select candidates, test mutual evaluation, live broadcast, and group in large classes. And so on can be completed by the “MOOC” APP.

5. Course Grade Evaluation Method

In terms of the reform of examination methods, a diversified, process-oriented and competence-oriented curriculum assessment system has been established. The evaluation content is diversified: online learning 15%, simulation report 5%, final exam 80%. Diversity of assessment subjects: teachers, students and the course platform jointly evaluate. Process assessment method: realized through online learning. Unit Tests 35%, Assignment + Mutual Assessment 20%, Course Discussions 10%, Final Exams 35%. Competency of assessment content: increase simulation report, strengthen reading and simulation ability test, improve the breadth and depth of course learning, add comprehensive design circuit and engineering practical problems in the final paper, enhance the challenge degree of course learning. Table 1 gives the specific contents of the assessment items, assessment requirements, proportion and so on.

Table 1 List of Course Assessment Methods under Automobile Construction

Examination item		Assessment requirement	Proportion	Ability training	Subject of evaluation
Online learning <input type="checkbox"/>	Unit testing	Each chapter ends with a unit test consisting of multiple choice questions, judgment questions, Analyze the composition of the calculation questions (35 points)	15%	Learning independently and thinking independently	Platform
	<input type="checkbox"/> Homework mutual	<input type="checkbox"/> Students are required to complete the corresponding work and also grade it <input type="checkbox"/>		<input type="checkbox"/> Analyze problems and be rigorous <input type="checkbox"/>	Student
	Course discussion	There are several discussion topics, according to the number of times students participate in the discussion and the number of students Thumb up number rating (10 points)		<input type="checkbox"/> Analyze the problem, the language expression <input type="checkbox"/>	Student +Teacher
	Comprehensive Test	Composed of subjective questions (15 marks) and objective questions (20 marks) (35 marks)		Basic knowledge and comprehensive application	Student +Teacher
Closed-book exam		There are traditional assessment content, as well as analysis, design, engineering practical problems and so on Multiple types of questions.Among them, simple knowledge is less than 20%;Comprehensive design > 60%;Engineering actual > 25%	80%	Knowledge mastery, combining theory with practice, Engineering application capability	Teacher
Experimental training		<input type="checkbox"/> Enterprise practice to complete a specified project <input type="checkbox"/>	5%	Hands-on activities	Enterprise mentor

6. Curriculum Evaluation and Reform Effect

As can be seen from the questionnaire survey, most of the students give high approval to the blended teaching model.A comparison of the results of the last two semesters shows that the mixed

class is superior to the traditional class. The results of the reform are mainly reflected in the following aspects: (1) Blended learning, in which students come to class with questions, creates a sense of hunger for students, increases their learning motivation, stimulates their interest in learning and arouses their enthusiasm in learning. (2) Online learning, as a preview and supplement, enables teachers to have time and energy to expand the breadth and depth of knowledge in class. (3) Improve students' independent learning ability and team spirit. (4) Face-to-face teaching in class adds a link of "teachers' puzzle-solving, discussion and extended teaching", which well solves students' problems in the process of simulation, experiment and small production after class, improves students' engineering application ability, and promotes the deep integration of theory and practice. (5) The introduction of scientific research results and cutting-edge technologies enables students to understand the research and development of automotive technology and the current situation of the industry through extended reading, which stimulates students' patriotic enthusiasm and awareness of studying hard, and embodies educational elements in the teaching process.

7. Conclusion

The construction of "gold lesson" is imperative. The combination of online and offline teaching mode has great reform advantages for the course "Under the Structure of Automobile" in our school. It has played a positive role in "student-centered and ability cultivation oriented". The course construction has achieved remarkable results, and it has been rated as the provincial online and offline mixed first-class course by the Department of Education of Hunan Province.

8. Acknowledgment

Provincial first-class undergraduate course (not offline) "Automobile Structure (II)" online and offline mixed course, (Hunan Education Tong [2021] No. 28; Serial number: 850)

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