Mixed Teaching Practice of Mechanical Drawing Course under the Background of New Information Technology

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Abstract

"Mechanical drawing" is a compulsory course for students majoring in machinery, based on the analysis of the course features, the teaching target and practical application point, combining with online teaching experience of 2020 and the present situation of related professional teaching in vocational colleges, using new information technology in the teaching model reform, building the leading online hybrid teaching mode with the student as the main body. Starting from the application of curriculum in professional curriculum, this paper reforms the teaching content, teaching implementation, teaching methods and practical aspects of curriculum.

Keywords

Mechanical drawing, mixed teaching, modularization.

1. INTRODUCTION

With the wide application of "5 g technology", "Internet +" in the era of teaching subject, teaching resources and teaching media elements such as updating and development of the information level of modern education put forward higher request, intelligent product and so on mobile phones, computers, tablets, the spread of the learning process broke the limit of time and space, changed the traditional mode of classroom teaching, the modern teaching mode reform. In the course of teaching reform, the school attaches great importance to the application of information technology, and explores the combination of "online" excellent college teaching platform and "offline" traditional classroom teaching, so as to present advanced, interactive, flexible and diverse teaching forms. At the same time, through the online and offline teaching experience, to enhance students' independent learning ability and innovative spirit, improve the project practice ability, achieve better teaching effect.

2. INTRODUCTION TO THE COURSE OF MECHANICAL DRAWING

As a compulsory course for students majoring in mechanical engineering, mechanical Drawing focuses on the combination of professional practice and theory. It is the first course for freshmen to contact engineering majors. "Mechanical drawing" can cultivate student's ability to understand mechanical drawings, understand the engineering professional term, familiar with and follow industry standards, improve the students' ability in 3 d space imagination for mechanical parts to determine the best expression way, to be able to read and draw mechanical engineering drawings, so that the students have strong ability of hands-on practice and the rigorous work attitude, make the engineering technical personnel's basic quality and ability.

As a basic professional course for mechanical majors, the mastery level of mechanical drawing has a direct impact on students' spatial imagination and map-reading and drawing skills, as well as the learning effect of subsequent professional courses. It also has a direct

impact on students' comprehensive practice, internship and training, and even students' future working ability.

3. THE CONSTRUCTION OF ONLINE TEACHING PLATFORM RESOURCES

In 2020, the sudden outbreak make our world a sudden "lockout", to better organize and implement the teaching activities, in accordance with the requirements of the Ministry of Education, teachers should make full use of online for class and provincial school, two levels of high-quality online courses teaching resources, relying on the online course platform of all types and at all levels, the campus network learning space, etc., actively carry out online teaching and online teaching activities such as online learning, ensure the quality of epidemic prevention and control during the teaching progress and teaching.

To better carry out online teaching, the use of the use of new information technology in the education teaching, combining the resources of the previous lesson for lesson and boutique resources sharing construction experience of the study, relevant teaching and research section organization "mechanical drawing" course teacher extensive study, according to the teaching task will refine knowledge, knowledge about teaching redesign, collect relative teaching resources, recording JingDuan video, or to collect related video resources for the implementation of online teaching.

3.1. Design of Teaching Knowledge Points

The online teaching process is not the enumerating and analyzing of traditional teaching knowledge points, but more emphasis on the systematicness and flexibility of teaching content, so as to fully arouse students' learning enthusiasm. In the course of knowledge in the design process to fully embody the standardization of the mechanical system design, physical, fundamental, in the process of teaching in combination with engineering practice project, will effectively combine theory with practice, the related knowledge of modularity, fragmentation, set a small knowledge, help students better understand the related content, improve the students' space imagination ability, knowledge chart and drawing ability!

For example, the teaching of basic body projection and axonometric drawing drawing part content, teachers taught in the previous projection and image recognition method, and the projection point, line and plane knowledge, after introducing the basic knowledge of projection, body for the understanding of the basic body will be introduced by physical basic body, and then through the demo link respectively introduce surface with a plane three-dimensional stereo projection rule, the teaching of plane surface with a 3 d solid three view drawing painting and dimensioning method, for the purposes of this part of the study, need students practice combining physical and animation, exercise their own abstract space imagination, lay a foundation for later study.

3.2. Construction of Teaching Resources

The construction of online teaching resources aims to improve the defects of traditional offline teaching, provide students with abundant learning resources and guide them to study more effectively. In combination with the teaching process of teachers, pre-class preview, live teaching in class and assessment after class are firstly carried out. The teaching resources needed in the teaching implementation process are divided into two parts: one is the curriculum teaching resources, and the other is the expansion resources. Teaching resources include mind map, learning task list, electronic teaching plan, teaching courseware, teaching case model, practice instruction book, after-class exercises and answers, classroom exercises, etc. The expanded resources are mainly used to assist the implementation of other excellent course resources recommended by teachers, relevant standards of mechanical drawing, reference textbooks and other exercises, etc.

4. BLENDED ONLINE AND OFFLINE CLASSROOM TEACHING PRACTICE

Based on the summary of the school's online teaching experience in the first half year of 2020, there are three main teaching methods adopted by part-time teachers in the school :(1) using online teaching platforms to carry out live teaching and classroom interaction, such as super star pan-ya platform, excellent college platform, rain classroom, etc.; (2) Tencent QQ group classroom, group live, nail group live, with the use of cloud class class management and interaction; (3) Use national teaching resource platforms such as Screen classes in Chinese universities, smart Tree online education platform and xuetang online to develop courses for broadcasting, and cooperate with the use of cloud classes for classroom management and interaction.

In the course implementation of Mechanical Drawing in this semester, the teaching platform of Excellent College is adopted to combine online teaching with offline teaching, so as to enhance the process implementation effect of classroom teaching (preview before class, learning and practice during class + consolidation after class). The specific implementation process of online teaching is as follows:

(1)Create classes, import teaching resources and student information, conduct student management, and invite students to enter classes by class number;

(2)Publish course announcements to help students understand how to use course resources and courseware;

(3)Release courseware resources according to the teaching progress, address and playing code of the course live broadcast for students to learn before class and in class.

(4)Set up curriculum resources, and each course resources include mind mapping, learning tasks, courseware, animation demonstration or micro video class, guide everyone's online preview, adopt the way of live with Shared resource class to guide students to preview before class, also can according to need to recorded part of demonstration teaching from the Internet.

(5)Offline course teaching: Integrated teaching environment is adopted in classroom teaching. Multimedia equipment is used for classroom knowledge explanation, animation presentation, screen sharing, student interaction, etc. Online course resources and computer software can be used for drawing practice, so that students can better understand and absorb the course content.

(6)Create course assignments and exercises, assign class assignments, topic discussions, quizzes and so on according to the learning content of each class.

(7)Performance evaluation: In this link, the online learning platform can be used to export students' attendance and usual scores, and the examination questions can be set up to organize students to take tests, and the relevant data can be exported to evaluate students' performance.

Online and offline students' learning process is relatively coherent and substantial. Before the beginning of the course, students should preview according to teachers' uploading of teaching resources and preview tasks. The progress of preview can be checked on the platform. In the classroom teaching process, combined with the teacher's lecture content, use the learning resources prepared by myself to carry out targeted task learning, find objects from real life, apply the projection and drawing theory learned to practice, and constantly improve my spatial imagination. At the same time, after class, I will complete the teacher's homework and tests, and at the same time, I can use the problem sets to do drawing exercises, get familiar with drawing standards and norms, and develop my scientific and rigorous professional quality.

5. CONCLUSION

In the teaching process, in order to fully reflect the "student-centered" guiding ideology, teachers pay more attention to inspire students, so that students from passive learning to active learning, from rote learning principles to learning tasks to mobilize the enthusiasm of students to learn, cultivate students' innovative thinking ability. Through the "online" learning situation creation, pre-class guidance, live broadcast and interaction in class, online test after class, practice and online q&A; "Offline" students conduct project practice, teachers provide real-time guidance, and students complete course learning through project summary. Teachers are no longer the leaders of students' learning, but participate in the learning process together. In the process of teaching implementation, teachers should select appropriate network resources and make reasonable use of information technology to promote students' learning and improve their learning quality.

REFERENCES

[1] Research on the Blended Teaching Mode of Mechanical Drawing Course based on MOOC, Wang Jingxiao Lu Yang Weihua, Journal of Higher Education, 2017.07, 88-91.

[2] Zhang Min. Discussion on the teaching reform of mechanical drawing under the Internet + Mobile Information Technology [J]. Computer knowledge and technology,2020,16(24):116-117+124.

[3] Chen Li, Zeng Min. Research on the Teaching Reform of Higher Vocational Machinery Specialty from the perspective of intelligent Manufacturing -- Taking the teaching reform of "Mechanical Drawing" as an example [J]. Vocational technology,2020,19(09):63-67.

[4] Pang Xu, Li Shuang. Research and Exploration on the Teaching Reform of Mechanical Drawing under the "Combination of Work with Study" [J]. Internal Combustion engines and Accessories, 2020 (15): 247-248.

[5] Yu Yaping. Analysis of "Online + Offline" Mixed teaching Mode under the new Situation [J]. Modern Rural Science and Technology, 2020 (10): 98.