

Study on the Course Reform of Civil Engineering Drawing Practice Based on Online and Offline Integration

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Abstract: Affected by the new coronavirus pneumonia epidemic, the online-offline blended teaching mode has gradually become the new normal of teaching. At present, a comprehensive online and offline integration teaching mode has not yet been formed, especially the teaching research on applying the blended teaching concept to civil engineering drafting practice is still lacking. Based on analyzing the characteristics of civil engineering drafting practice teaching and the problems existing in teaching, the hybrid teaching mode of online and offline integration is proposed. The results of the study show that the blended teaching model can improve students' interest and learning effectiveness, enhancing their abilities and skills in practice. Meanwhile, the model also provides teachers with more teaching resources and innovative teaching methods.

Keywords: Blended learning; Instructional reform; Instructional design; Instructional evaluation

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Civil engineering drawing practice course is a compulsory basic professional course in higher education of civil engineering majors, the course is mainly to cultivate students' spatial imagination, logical thinking ability and certain drawing ability. Along with the high-speed development of Internet technology and scientific and technological information, it brings new opportunities for civil engineering drawing practice course. In addition, under the influence of the impact of uncertain factors such as the new crown epidemic, the traditional offline teaching mode has been challenged, and there is an urgent need to explore an effective hybrid teaching mode.

Domestic and foreign scholars have conducted research and exploration in different disciplinary fields regarding blended online and offline teaching. Jin Shi et al.^[1] conducted optimization research on online and offline blended teaching strategies from various aspects, such as innovating teaching design, creating teaching environment, and reconstructing teaching evaluation, in response to the policy background and teaching status in the post pandemic era; Wang Hongyi et al.^[2] used the thermal process control system as an example to explore and study the online and offline hybrid "golden course", exploring and practicing the ideological and political construction of courses from the aspects of ideological and political elements, teaching methods, assessment and evaluation; Shao Xiaoxia et al.^[3] conducted research on the current situation, models, and paths of the mixed development model of online and offline English teacher education courses, providing some reference for the construction of the "golden course" of applied university English teacher education; Huang Gen et al.^[4] used the course "Mineral Processing: Physical Mineral Processing" as an example to construct an online teaching platform for the course by recording micro lesson videos, creating teaching animations, establishing a teaching resource library, and introducing process assessment indicators. They explored the impact of mixed online and offline teaching on the teaching methods and assessment of the course; Liu Longgang^[5] conducted research on the online and offline hybrid teaching mode of the basic principles of concrete structure course in civil engineering, and explored teaching strategies for different

course stages; Hu Xiao et al. [6] explored the reform and practical methods of online and offline hybrid courses in computational fluid dynamics, proposing reform methods for offline theoretical teaching, online case teaching, and online and offline hybrid classrooms; Yang Jun et al. [7] introduced self-media teaching methods into the teaching of Civil Engineering Introduction course, starting from analyzing the necessity of using self-media teaching in Civil Engineering Introduction course, and solving difficult problems such as fragmented course knowledge system, wide knowledge range, and limited professional internship. Other related research has played a certain role in promoting information technology teaching and blended learning.

1. Civil Engineering Drawing Practice Course

Civil engineering drawing is a basic professional course that must be studied in the civil engineering and construction industry, and the course is mainly to cultivate students' rich spatial construction ability and thinking logical thinking ability, and to a certain extent to improve the drawing ability of civil engineering students. Through AutoCAD and Tian Zheng architectural software to draw building construction drawings, students can be taught to conceptualize the building structure so as to carry out preliminary drawing design, and accurately calculate the structural information of the building to achieve the purpose of cultivating the hands-on ability of the students, so that the students are able to accurately express the design conception and intention, and cultivate the students' rigorous scientific attitudes and meticulous work style for the subsequent course design. This will lay a solid foundation for the subsequent course design, graduation design, and future engineering work, and improve the design development and innovation ability.

2. Teaching Process of Online and Offline Integration Teaching Mode

Traditional teaching has long adopted a teacher centered teaching method, with teachers teaching on stage and students listening off stage. Under the premise of tight curriculum and high requirements for standardized and refined teaching, it is difficult for students to have time for interaction and communication. The classroom is arranged in a "cramming style" manner, which makes it difficult to stimulate students' sense of participation. Students' ability to learn independently is limited, leading to students being tired of learning and teachers being tired of teaching. Compared with traditional teaching models, online teaching is conducted through voice or video, and there is a lack of face-to-face communication between teachers and students. There are still some differences in teaching management, classroom effectiveness, and student feedback compared to traditional classroom teaching models [8].

2.1 Do a good job in the pre class introduction process

As the beginning of the overall course teaching process, the pre-course introductory link should be used as an extension of the classroom teaching activities, highlighting the advantages of the application of the new teaching mode. Whether it is teaching courseware or self-study test questions issued, can rely on the new teaching mode of the online network platform to carry out, and students complete the self-test answer correct rate, the teacher can also be viewed through the platform, so as to understand the content module of the students who are difficult to understand the appropriate adjustment of the teaching program to enhance the learning efficiency of students in the formal course of teaching [9].

2.2 Enrich teaching methods in class

In the role of the new teaching mode, the traditional classroom teaching methods can be changed, teachers have more time to carry out the teaching content of the key difficulties in the discussion and research. Teachers can use some distinctive examples to carry out case teaching activities so that students through the analysis and discussion of the case events, combined with the relevant theoretical knowledge of the course, the ability to use the knowledge and the ability to practice hands-on ability can be strengthened, and to promote the enhancement of the students' comprehensive ability and quality level [10].

2.3 Conduct after-school discussion activities

Under the application of blended online and offline teaching mode, students' learning activities such as reviewing and consolidating knowledge after class also need to rely on online platforms. Teachers should regularly collect students' questions in the discussion areas, organize and summarize them, and provide special course explanation activities for students in the future, which can improve their learning efficiency [11].

3. Implementation of Online and Offline Integration Teaching Mode

According to different course objectives, targeted implementation plans are arranged as follows:

(1) Establishing a comprehensive civil engineering drawing and practical teaching system should first enable students to integrate theoretical learning with practical learning such as engineering drawing during the learning stage. It should be guided by the practical application of engineering drawing and CAD and achieve the goal of practical education for students.

(2) The correct integration between CAD course teaching and civil engineering drawing should be taught using the latest

modular teaching mode and a combination of theory and practice, emphasizing the real-time and comprehensive teaching content. So, in the curriculum, teachers should focus on combining the learning goals of students in our school with the systematic content of these two courses.

(3) Considering the requirements of quality education and the Ebbinghaus memory curve, arrange students to learn according to the process of "preliminary preview - in class teaching and answering questions - after class simplified practice". Online mainly involves preview and review, while offline teaching, answering questions, and practicing with targeted methods.

4. Conclusion

(1) The blended teaching mode of integrating online and offline can not only give full play to the advantages of modern teaching equipment and the Internet, but also minimize students' fatigue of thinking in the learning process and stimulate their interest and potential in learning.

(2) The teaching of the civil engineering drawing practice course incorporates the specification into online learning, and the explanation of teaching difficulties is arranged in classroom teaching. The results of the blended teaching show that it integrates online and offline has better learning effect and helps the cultivation of innovative practical talents.

In summary, mastering the knowledge content of the practical course of civil engineering drawing is crucial for students to improve their personal professional knowledge and theoretical level, and is also a basic requirement for improving the overall teaching level of civil engineering majors. Based on this, teachers should actively change their teaching methods and strategies, and through the rational application of the online and offline hybrid teaching mode, stimulate students' learning enthusiasm and desire, so that students can gain more professional knowledge during the course learning process, improve their professional and practical abilities, and promote the steady improvement of the teaching quality of civil engineering drawing practical courses.

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