Research on the Application of 3DS MAX Course in Teaching Environmental Design Major at Private Colleges

The Application of 3DS Max Course in the Teaching of Environmental Design Major in Private Colleges and Universities

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Abstract. With the development of society, computers are widely used in various fields and play a crucial role, especially in the design field. Computer-aided design (3DS MAX) is a computer-aided design performance course that follows computer-aided design (PS), computer-aided design (CAD), and computer-aided design (su) courses, and has become a required course in various universities' environmental design majors. How to enable students to master the 3DS MAX technology of this major three-dimensional software in a limited time and adapt to job requirements has become one of the teaching difficulties facing many universities today. Based on this, this paper briefly explores the application of computer-aided design (3DS MAX) in the teaching of environmental design majors in private universities based on practical teaching experience.

Keywords: 3DS MAX · Environmental Design · Blended Learning · Campus Scene-based Teaching

1 Introduction

3DS MAX is a widely used 3D design software, especially in the field of environmental design, which is a professional design software for producing design scheme renderings. However, due to the strong professionalism and high complexity of the 3DS MAX software, as well as the weak theoretical foundation and practical ability of students, there are some problems in teaching this course. How to solve these problems and achieve better teaching quality is worth exploring for teachers in environmental design universities. This paper deeply considers the teaching of computer-aided design (3DS MAX), starting from macroscopically grasping the talent training program of environmental design, based on the outline framework structure, and integrating new teaching methods and means.

2   The Role of 3DS MAX Course in Environmental Design Education

2.1   The Position of Computer-Aided Design (3DS MAX) in the Talent Cultivation Program of Environmental Design

According to the survey, among 10 undergraduate majors in design, there are over 700 universities that offer environmental design/visual communication design majors (one of the two majors with the highest number of offerings in art-related fields), accounting for 12% of the total major distribution. As the economy develops rapidly and people's living standards improve, their pursuit of aesthetics becomes increasingly stronger. Environmental design, as a subject that creates beauty, is becoming more and more popular [1]. From the perspective of the demand for environmental design personnel in China's job market, there is a great demand for design technical talents, and there are also many available positions. Therefore, schools should cultivate high-quality applied talents with knowledge innovation ability and design practice ability. Taking the talent training plan of the environmental design major at Wuhan Qingchuan College as an example, based on the school's applied talent training objectives, this major's talent training plan focuses on the skills training of job-positioned personnel. According to the requirements of enterprises, such personnel should have practical experience and be proficient in using various computer-aided design software. Among the commonly used software, 3DS MAX can accurately model and demonstrate design results in a realistic, photo-quality manner, saving a lot of time and effort compared to the repetitive and highly modifiable time cost of hand-drawn expressions [2]. Therefore, it is necessary to cultivate this skill among environmental design students.

2.2   Analysis of Computer-Aided Design (3DS MAX) in the Professional Curriculum System

Before offering each course, based on the consideration of talent cultivation, the framework of the curriculum, and the logical relationship between the courses, Fig. 1 shows the talent cultivation framework of the six major modules in the School of Design Engineering of Wuhan Qingchuan University. Computer-aided design courses are the bridge between the theoretical foundation module and the applied practice module. As a course in computer-aided design with certain challenges, difficulties, and depth, it integrates professional technology and design thinking in the curriculum.

From the perspective of course matching ability, the learning of this software knowledge cultivates students' spatial imagination and creativity; through specific design projects, students understand the design process and develop their teamwork skills. Therefore, mastering the knowledge and methods learned in this course will lay a good foundation for students' participation in design projects, design competitions, and future employment, as shown in Fig. 2.
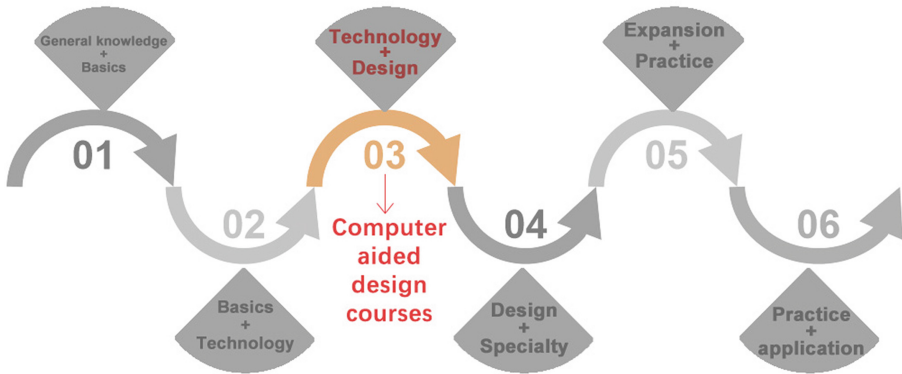
Fig. 1. The talent cultivation framework of the six major modules in the School of Design Engineering of Wuhan Qingchuan University

Fig. 2. Curriculum matching ability of environmental art design major

3 The Current Status and Existing Problems of 3DS MAX Course Teaching

3.1 The Teaching Form is Too Single, and Students' Learning Enthusiasm is not High

The traditional teaching method mainly relies on the teacher's explanation of knowledge, and students passively accept knowledge, which will make students lose their enthusiasm and initiative in learning, and the teaching effect and quality are not satisfactory. Although 3DS MAX teaching intersperses the teacher's operation demonstration in the explanation of theoretical knowledge, this is no different from the teaching of other software courses. This single teaching form affects students' learning interest, cannot achieve the teaching objectives of this course, and cannot improve students' innovative consciousness. How

to improve students' learning initiative is the primary problem faced by 3DS MAX teaching.

3.2 The Course Difficulty is High, and Students Are Unable to Integrate Knowledge Effectively

3DS MAX software has nearly 50,000 commands, and its functionality is extremely powerful, making it difficult to learn. Students tend to forget what they learned quickly [3], and the combination of theoretical lectures and simple operation demonstrations in textbooks cannot achieve the best learning effect. Based on my previous feedback on 3DS MAX teaching, as well as surveys of some graduates of environmental design in higher education institutions, students lack the ability to flexibly apply the basic operations of the software and cannot integrate it with actual work and design creativity. The critical issue that cannot be ignored in 3DS MAX teaching is how to closely link the various commands with practical application scenarios, thus improving the systematic and associative nature of the knowledge.
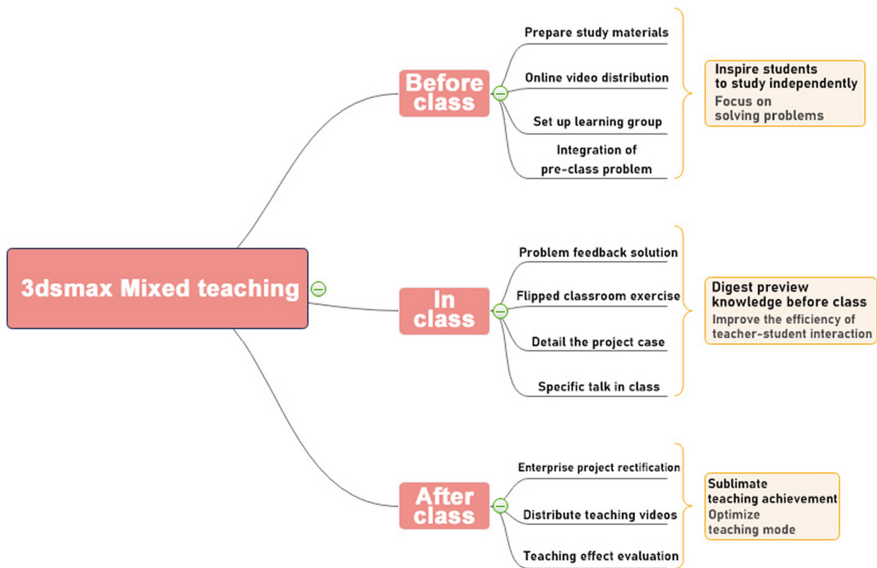
4 Specific Strategies for Reforming the Teaching Method of 3DS MAX Course

4.1 Specific Strategies for Reforming the Teaching Method of 3DS MAX Course

This course adopts a "blended" teaching method to promote teaching mode reform, enhance the quality of talent training, increase the diversity and effectiveness of learning methods, and promote the orderly development of teaching process. "Blended" teaching can not only give full play to the leading role of teachers in guiding, inspiring, and monitoring the teaching process, but also fully reflect the initiative, enthusiasm, guidance, and creativity of students as the subject of the learning process, which is conducive to promoting the personalized development of students.

The "blended" approach of this course is closely related to the new requirements of classroom teaching in the post-epidemic era and the urgent needs of college students born in the Internet age for modern teaching methods. It fully utilizes high-quality and convenient online course resources and powerful mobile interaction functions to reform the typical teaching mode of "45-min" teacher-led and passive student learning in traditional classrooms into a "vertical and horizontal" blended teaching mode, extending the axis of learning time and space and the methods of teacher instruction beyond the classroom, and fully reflecting the student's subjective position. A teaching model based on "student-initiated learning, teacher-assisted improvement" is gradually constructed. The teaching implementation process is shown in Fig. 3.and can be replicated and promoted in similar courses.

Before the 3DS MAX course starts, a class learning group will be established to facilitate the dissemination of learning materials. Short online videos will be provided before each class, allowing students to preview the key knowledge points of the next class in advance. Based on online student learning and feedback, targeted explanations will be given in class for difficult and important topics. The main presentation during class will be

Fig. 3. Specific Strategies for Reforming the Teaching Method of 3DS MAX Course

in offline teaching mode. A mixed approach of "theory + practice" will be used in offline teaching, with the theoretical part presented in an organized and mind-mapping teaching style, as shown in Fig. 4. The practical part will use visible examples from around us and specific company projects for practice. Students will discuss and share more effective learning methods and experiences through case studies, with each other taking on the role of "teacher" for demonstrations. This approach enhances students' awareness of active learning and cooperation ability, and helps to improve the relationship between students and teachers. Reasonable implementation of online and offline information teaching, utilizing the advantages of both teaching methods, complement each other and promote each other, which can better meet the learning needs of students at different levels.

4.2 "Campus-Style" Scene Teaching Method

The "Campus-style" scene teaching method utilizes everything that can be observed on campus, such as objects, indoor scenes, outdoor landscapes, architectural structures, public facilities, etc., allowing students to immerse themselves in the environment and experience the proportions, scales, spaces, and lighting of objects, creatively modeling and rendering them to enhance their learning enthusiasm.

(1) Using Campus Objects as Exercise Materials

In the teaching process of this course, due to students' lack of familiarity with the relationship between models and real objects and weak grasp of basic commands, the course progress is difficult to proceed smoothly. Therefore, in the early stage of the course, a large number of campus-visible objects will be integrated to gradually infiltrate the operational principles of the 3D software, allowing students to have a more intuitive feeling
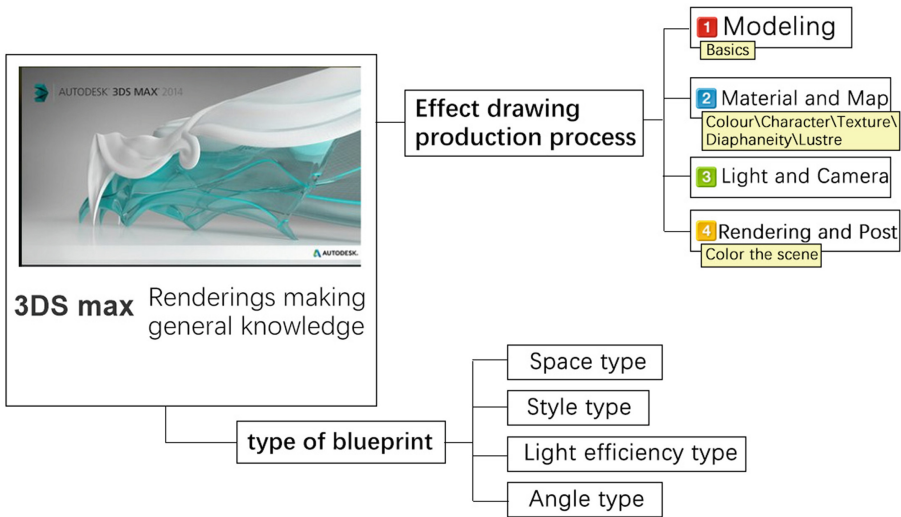
Fig. 4. An organized and mind-mapping teaching style

of the size, proportion, and texture of objects, and establish a knowledge framework of "knowing the reason and knowing the result". For example, in the modeling process, students can choose small objects in the classroom, such as desks, chairs, computers, mice, doors, windows, or small items in the dormitory, such as beds, wardrobes, and washbasins, and take photos and measurements on site. With familiar and actively chosen materials, students are encouraged to have a sense of active exploration.

(2) Campus Small Scenes as Regular Assignments
Using student dormitory spaces and classroom spaces as regular assignments, because the volume of these two spaces is not large, students can observe the actual spatial and scene effects vividly [4]. Compared with the "visible items around them" small items, these two spaces are close to the standards of the final assessment in terms of the steps and requirements of measuring, modeling, camera setting, rendering, and outputting images, but there are also some differences. This enables students to progressively master knowledge and skills.

(3) Campus Large Scene as Final Assessment
The assessment of the course is based on the principle of objectivity and diversified assessment methods. It is not only based on a single assignment or the final project as the only reference for grades [5]. The assessment method of this course requires students to complete a single image of the campus building scene and a panoramic effect of a certain indoor space in the campus. The student's assessment score will be composed of three parts: daily assignments, daily performance, and final assessment, with a weight ratio of 3:2:5. Through the examination of this course, students' basic mastery of 3DS MAX-related knowledge and skills can be tested. Most students can operate the model, texture, material, lighting, and camera proficiently, and have the ability to independently

complete the design plan and effect map production. Finally, the presentation of the final project will be shared through an online QR code, and students can learn from each other, supervise and progress together through their works.

5 Conclusion

In today's era of increasingly advanced computer application technology, especially in the field of digital image production, technology is constantly evolving. Therefore, our teaching content and methods must be adjusted and continuously improved to keep up with the times. In the teaching of this course, I have constantly explored and sought effective teaching methods, from "blended" teaching to the exploration of "campus-style" scene teaching, gradually improving the quality of teaching and laying a solid foundation for students to acquire knowledge and smoothly enter the workforce.

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