Exploring the Establishment of Teaching Resource Database for Computer Rendering Design Course

Lu Tan
Chengdu Agricultural College, Chengdu, Sichuan, China

Abstract: Today, the emerging AI modeling is gaining popularity, but the traditional rendering still occupies an irreplaceable position, especially in the conception and modification stage of the program, when the designer uses the detail modification to capture the ever-changing thinking and serve the program conceptual engineering. Aiming at the prevailing problems and misunderstandings in current rendering course, it is proposed to improve the efficiency of the course by establishing and updating the project course resource database, introducing the actual engineering project topics, and constructing the open classroom teaching to enhance the connection between the rendering classroom and the design market. In addition, it is proposed to improve the students' motivation in learning, enhance their innovation ability, lay a solid foundation for the learning of the professional design courses.

Keywords: Interior Rendering Design; Modular Course Resource Database; Teaching Reform; Digital Means

1. Foreword

The architectural decorative rendering course of architectural decoration is an important professional foundation required course. The course includes theoretical study and technique practice. The theoretical study accounts for a quarter of the total class time, which mainly explains the use of 3Dmax, sketch master and other modeling software basic tools operating techniques, modification system, lighting materials, and drawings. Focusing on students' practical training is the characteristic of this course. Through the study of architectural decoration design rendering course, students can understand the main function of rendering and its role in architectural decoration design, master the basic rendering operation techniques and use them skillfully, and gradually form a distinctive personal operating style. Mastery of the basic operating tools and techniques is the focus of the course, and the students can master and apply them through repeated copying. The difficulty of the course is the combination of interior design operation with design thinking. The students are required not only to be able to make beautiful renderings, but also know how to apply them to the desisgn and conception of the program, and help themselves to analyze and understand the environmental conditions and design content.

2. Status and Problems of Teaching and Learning

The current architectural decoration rendering design course has achieved certain results based on traditional teaching, but with the rapid changes in the design market, interior design rendering is also developing, and its function in architectural decoration design has also changed. [1]By following the traditional teaching methods, some deficiencies are gradually revealed and need to be improved.

2.1 The Architectural Decoration Design Rendering Course should Jump out of the Traditional Software Education Framework, and Make Clear the Cultivation Direction

As a professional basic course, the architectural decoration rendering design course is generally arranged in the second year. During this period, students enter the professional design course at the same time, and spirally learn the design principles, procedures, elements and other content in the course. Therefore, the understanding of interior design rendering expression is often phenomenalized, one-sided, and patterned. According to the former teaching experience, most of the second-year students are prone to misinterpret the interior design operation as a

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simple computer-type class when they are first exposed to it. Therefore, their learning methods are mostly based on traditional listening and watching basic operations and then training on basic tools. From the results of the work, through the repeated practice with specific models, students can basically build accurate models, but from a deeper level, they do not understand the delicate performance of the interior design operation, nor can they understand the real function and purpose. Therefore, teachers should clearly point out the difference between interior modeling operations and actual creation at the beginning of the course, and help students clarify the learning objectives and establish the corresponding grading standards according to the characteristics of the course to help students quickly enter into this course.

2.2 Due to Little Connection between Teaching and Actual Cases, Students Lack of Motivation.

Lack of understanding and participation in actual cases is another shortcoming of the current interior rendering design course. As we all know, with the development of computer technology, AI renderings are commonly used because they are accurate, realistic, easy to modify and save. Students are often attracted by the powerful AI technology and AI rendering, but neglect the training of operation skills. Traditional rendering operation learning is mainly based on copying, students have little opportunity to understand and participate in the actual case, and have no idea of how to apply the skills in design practice, so that the learning process and learning purpose is disconnected. Long-term learning mode of copy mechanically can easily make students feel bored, reduce their enthusiasm for learning, and even raise doubts: since AI technology is so developed, why do we still need to learn complex software operations? Therefore, in the actual case, combing some simple design elements to teach operating techniques will make the course more targeted and practical.

2.3 Teaching Materials are not updated in Time, and the Teaching Content is Relatively Outdated.

On the material basis of scientific and technological progress, the development of modern architectural decoration design is also very rapid, with design concepts, design styles, means of expression, and tools of expression continuing to emerge. Take interior design operation as an example, in less than a decade, the updating of the operation of teaching materials and teaching content is not as rapid as the design market. It takes time for new means of expression and the fashion trends to be incorporated into the textbook to get to the classroom. [2]Institutions often order a textbook to be used for three to four consecutive years for economic reasons. Teachers often develop their own teaching projects to add new content and promote new tools.

Given the deficiencies in the current teaching, the following innovations have been explored in practice. The first three of them are solutions to the three problems mentioned above, and the fourth is an outlook on the future development of rendering teaching.

2.4 Creating an Operational Course Resource Database to Optimize Learning Methods

The in-depth implementation of case study teaching in architectural decoration rendering design course is the entry point of teaching reform. The single teaching method of delivering knowledge, assigning homework, and students' passive acceptance in the past has changed into an interactive two-way learning mode combining the planning and organization of the teachers, and the independent thinking, participation, and collaboration of the students. . The first step to optimize the reform of teaching is to build a course resource database. According to the requirements of the syllabus and the course plan, collect a large number of interior design project cases (operation program expression, site pictures, and completion of results, design ideas, design evaluation, and other graphic materials) to enrich the classroom resources. Based on the illustration of interior modeling design operation, the course resource database should be mainly composed of illustrations and lecture videos, which need long-term maintenance and prompt updating after completion. The construction of the database firstly solves the problem of students forgetting the knowledge points in the operation copying stage. But more importantly, it can comprehensively and intuitively

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interpret the design process to help students understand as early as possible the development and transformation from the two-dimensional design drawings to three-dimensional rendering and four-dimensional real space. Learning in this way makes the rendering course sustainable in the long run, and students learn not only operational techniques but also spatial thinking patterns and design concepts. The materials in the case gallery can also be shared for subsequent design courses in the Architectural Decoration Design program.

2.5 Introducing practical projects to Stimulate Learning Motivation

The rendering design has strong practical characteristics, so the students' teamwork, three-dimensional thinking, and communication skills are especially important. Case teaching requires teachers to use actual projects as the carrier in the operation course, and discuss the solutions with students. Specific content can be extracted from the course resource database of a project, or the interior design renovation of a place at the campus, or taking the topics of architectural design competition as a design task, requiring students to express their design ideas in the form of rendering. If students have already studied drawing and CAD in the prior course, they can be required to express their design ideas by combining the renderings with the program design drawings for better results. [3]Through assigning a topic and implementation, the students can contact the actual project as early as possible, understand the purpose and nature of the design, and completely change the situation of focusing on the phenomenon but not the essence in the traditional operation of the class teaching, so as to make the learning more participatory and practical, and the students are prone to have a greater sense of recognition and achievement. [4]At the same time, it also paves the way for the design course of the decoration major.

2.6 Combining Computer-aided Tutorials and Utilizing Advanced Tools

In recent years, design expression techniques and realization tools are constantly being introduced, especially digital operation. It is important for every teacher to be receptive to new technologies and tools, and to be enthusiastic about learning them. Both traditional operation and computer software drawing have their own strengths. The combination of the two can accelerate and deepen the efficiency of design output. In the teaching of operation course, students should be encouraged to try new digital tools, such as the tablet expansion APP, and use SketchUp, AutoCAD, Photoshop, and 3Dmax to assist in solving the problems of perspective and scale in operation, so as to improve the efficiency of operation. Take the program template of computer software and digital input products to assist the rendering operation as an example, as shown in Figure 1, students can choose freely the mode of learning 1+2+3 according to their familiarity with digital products and computer software [5,6].

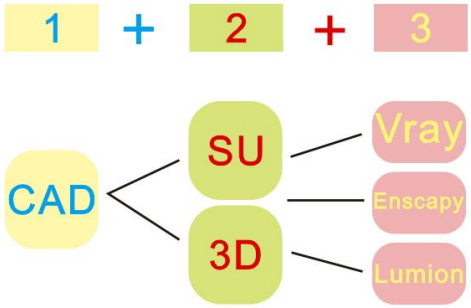

Figure 1. Schematic Diagram of Digital Operation Flow 1+2+3 Mode

2.7 Crossing Classroom Limitations, Exploring Open Operation Teaching based on the Design Studio Model

Mode 1: Go out of the classroom, go to the actual environment to investigate and map, and then bring back the data to the original site for the interior rendering design and remodeling creation. Finally, the results of the work will be evaluated and exhibited by comparing the operation scene and the operation design rendering drawing.

Mode 2: Go into the design company and designer's studio, visit the design process, participate as much as possible in the operation of the rendering drawing process, actively attend the relevant practical competition, and obtain the advice and help except for those from the classroom and the teacher, to strengthen the innovation of the integration of production, learning, and research.

Model 3: A model of collaboration between the lower-level manipulative courses and the

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upper-level design courses forms a mutual-aid design group, so that students can experience the sustainability of the operation courses and learn with a dynamic and evolving philosophy and attitude.

Mode 4: Students are led to explore all professional fields related and similar to interior design operations, such as visiting the studios of animation scene operators and illustrators to understand their work patterns and processes, draw nutrients from other art and design disciplines, obtain new inspirations, and enhance the interest and attraction of the course [7].

3. Teaching Reform Practices

The teaching reform of the operation course is a long-term and continuous work. At present, a three-year cycle of teaching reform of operational courses has been carried out for senior students in the architectural decoration major, and some results have been achieved after the gradual application of the new teaching models and methods.

On the one hand, the construction of the operation course resource database enables students to quickly understand the concept and connotation of the operation of interior rendering design, due to the rich and representative content of the course resource database. On the other hand, with the introduction of real design projects as the assessment content in the course work and assessment, students treat the homework with high enthusiasm and can use the learned operational expression techniques to carry out spatial design, and quickly obtain the basic ability of spatial imagination and transformation, which prepares them in advance for the later design courses. According to the feedback from the students after the course, most of them think that the teaching content is closely related to the design practice, and the operation ability has been rapidly improved in a short time [8-10].

The focus of this teaching practice is to solve the problem that students are only good at copying but not good at creating, and the difficulty is the selection of actual projects. Because it is aimed at the learning situation of the students in the lower grades, the introduction of real projects should be relevant but not beyond the ability of the students.

4. Conclusion

Architectural decoration rendering design courses should be adjusted with the progress of design concepts, means of expression and tools, and should be comply with the needs of the national curriculum construction of teaching reform, timely adjust the teaching methods, study and solve the problems existing in traditional teaching. It shall focus on the practicality, pertinence, advancement and perceptiveness of hand-drawing courses, so that the classroom teaching can play a more effective role and effectively cultivates the students' innovative ability and practical ability.

Acknowledgments

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