

**Discussion on the Construction of Key Course for Digital Media Specialty**

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**Abstract.** Digital media is a new specialty, which is the cross-integration of technology and art. As a new specialty, there are many problems to be solved. Three dimensional design and creativity is the one of key courses of digital media major. The course is very practical and highly operational. This paper presents a whole scheme of construction on the course, including curriculum system and teaching content, teaching methods and teaching resources etc. Its effectiveness has been proved after practicing of students, which is a important part of digital media specialty construction.

**Introduction**

Digital media is typically interdisciplinary[1,2], including a wide range of fields, involving computer hardware and software and applications, coding and numerical processing methods, electronic communication and communication technology, digital media content production and management, digital media copyright, digital media art and so on. The curriculum system of digital media specialty includes digital media introduction, computer graphics, digital image processing, graphic design and creativity, three dimensional design and creativity, computer animation, computer games, digital video and audio, non-linear editing, scientific computing visualization, multimedia technology, virtual reality technology etc. We can see that the course system covers technology and art. As a new specialty, there are many problems to be solved [3,4]. It is urgent for teachers to research on the specialty construction. In order to achieve the goal of development, our team focuses on the key course construction in this paper.

Three dimensional design and creativity is the master course of digital media specialty. In the process of teaching design, the teachers of the course group adhere to the idea of adapting to the goal and market demand of the specialty. The course is very practical and highly operational. According to course features, we proposed a whole scheme of course construction on three dimensional design and creativity. It is a important part of digital media specialty construction. In the following sections, we will explain them in detail.

**Course System and Teaching Content**

Currently the course content is relatively general and lack of relevance. When students finished the course, they often don’t know how to use it. On the other hand, the design course is closely related to the art field. The course needs to combine the technology and art content. The teachers of the course group carefully studied the setting of the course in the famous universities at China and abroad [5,6,7,8], and discussed the teaching content arrangement and organization method of the course. The design method and process of indoor renderings and architectural animation are introduced, which can stimulate the students' interest in learning and study enthusiasm, and improve the competitiveness of students in employment. In the classroom teaching process, we follow the procedure of three dimensional design works and produce the main part of the knowledge module division and explain, as given in Table 1.

Three dimensional design and creativity is a strong practical course. The knowledge points are with a wide range of novelty and interdependence. The purpose of experimental teaching is to consolidate the students to understand and master the knowledge points by the actual operation of the
machine. So students can do the application of three dimensional design using related software of three dimensional works design. Based on the case, this course has some vivid examples of experiments, combined with the final comprehensive design, to develop students' ability to analyze problems and solve problems in order to prepare for the development of projects and in-depth study.

Table 1. Teaching content outline.

<table>
<thead>
<tr>
<th>Chapter title</th>
<th>Chapter 1</th>
<th>Chapter 2</th>
<th>Chapter 3</th>
<th>Chapter 4</th>
<th>Chapter 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Introduction</td>
<td>Architectural performance overview</td>
<td>3D modeling foundation</td>
<td>Advanced modeling</td>
<td>Material and texture</td>
</tr>
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<td></td>
<td>Chapter 6</td>
<td>Chapter 7</td>
<td>Chapter 8</td>
<td>Chapter 9</td>
<td>Chapter 10</td>
</tr>
<tr>
<td>Chapter title</td>
<td>Lights and cameras</td>
<td>Rendering and settings</td>
<td>Indoor design</td>
<td>Architectural performance</td>
<td>Architectural animation</td>
</tr>
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</table>

**Teaching Methods**

In order to help students better grasp and understand the basic knowledge of three dimensional design, and achieve the combination of theory and practice, the course group teachers give design of teaching and experimental content, and actively explore the case. According to the knowledge structure and knowledge difficulties, we break down the case into a series of teaching modules and experimental modules. By different teaching methods, such as classroom case analysis, group discussions and works show and so on, students can carry out three dimensional design practice step by step, and exercise its comprehensive use of knowledge to solve practical problems. Specific teaching methods and means are described as follows:

**Case-based Teaching Methods**

In the past, classroom teaching often introduced the relevant theoretical knowledge, the lack of targeted practice. Differently our group teachers determined the indoor design and architectural performance as the background of the application for this course. In view of the characteristics of the industry, the basic concepts and difficulties in the three dimensional design are taught, combined with a large number of practical cases.

As shown in Figure 1, we give an example of a case in architectural performance part: complete the architectural performance chart according to AutoCAD drawings.

![Figure 1. Production of architectural performance renderings.](image)

**Combination of Theory and Practice**

Three dimensional design and creativity course is a combination of digital color, digital image processing, geometric product modeling and design, graphic design and creativity and so on. The course mainly introduces the production of three dimensional design works, and is a strong practical course. The course group teachers not only emphasize the basic theory and the basic knowledge of the teaching, but also pay attention to strengthen the cultivation of students' practical ability. Through the diverse experimental system, students' practical design thinking and practical ability can be improved.
Innovative Teaching

The course group teachers analyze the characteristics of indoor design and architectural performance in the industry, and absorb some of the design company's advanced design concepts and design methods, and apply them to teaching. Through the design of a number of classroom case analysis, group discussions, group works show and other forms of teaching, students have high enthusiasm on learning. At the same time, the research group teachers in time introduce the latest research results and research hot spots of china and abroad into the teaching, to ensure the advanced nature of teaching content. We also promote students to study the problem, think about the problem and improve their innovative thinking ability.

A Variety of Evaluation Methods

Three dimensional design and creativity course is a practical course, so the evaluation way for students should not be limited to single way, such as the final examination. And we should design more scientific and reasonable way of evaluation, which not only can evaluate the comprehensive study of students and the degree and the quality of grasping knowledge, but also can stimulate students’ initiative and enthusiasm to learn. This course evaluates student achievement by combining the final exam (70%) with the usual study (30%) (homework and experiments). The final exam is conducted by submitting the design work and having the defense.

Teaching Conditions and Teaching Resources

The digital media technology key laboratory of Shandong province effectively supports the development of digital media disciplines and specialty, and improves the practice of students operation ability. The key laboratory is equipped with excellent machines, such as VR, capturing animation, non-line editing and other advanced equipment, which provides a good research environment for us. The library of school provides the team with relevant library materials and data retrieval. The famous scholar of China is the director of laboratory academic committee. The well-known domestic and foreign experts and scholars joined the laboratory, making the laboratory has an open and advancement. It also provide a superior condition for the team teaching and research.

The course teachers make full use of multimedia teaching environment, preparing detailed and rich multimedia courseware and combining with a large number of cases. The design of works and analysis and other teaching methods can fully stimulate students' interest in learning. This course focuses on the experimental teaching, relying on the experimental center of computer science and technology college, and having the basic experimental teaching. Through a series of basic experimental module exercises, students can grasp the classroom teaching lectures of each knowledge points, and ultimately complete the integrated design tasks. The course group teachers have carefully prepared for the teaching and experimental outline, and given the experimental purpose and operation steps of each experiment in detail. By the practice of these experimental projects, students can firmly grasp the knowledge learned to improve the students hands-on ability.

Because the digital media specialty is a new specialty, three dimensional design and creativity course has no suitable teaching materials. The curriculum group teachers access to a large number of information, including a lot of existing teaching materials, and carefully select the teaching content to ensure the compactness and rich of teaching content, theory combined with practice. We arrange weekly Q & A time, to let students have fully communication and discussion with teachers. For the latest content, we give a large number of online reference materials to students to access and study, to improve their active learning and innovative thinking ability. At the same time, teachers give open space online, providing a lot of teaching resources, and admit students to upload experiments and works to space, while students can also download the learning materials on the network, and communicate problems with teachers.
Course Teachers

The team structure of course teachers is reasonable. We have teaching experiences and strong scientific research abilities. In view of the teaching of the course, the teachers of the research group have carried out sufficient research and designed a large number of cases to ensure the teaching content reasonable and fully theoretical and practical. Around the construction of curriculum, the teachers can carry out specialty training and participate in the actual project design, to further improve their specialty and technical level, and deepen the construction of curriculum content, and enrich the teaching case. Through the introduction of more talents to join, it can also provide more teaching methods and means for the curriculum construction.

Summary

A course construction includes many aspects. As a key course of digital media major, it is important to discuss on the construction of three dimensional design and creativity course. In this paper, we proposed a whole scheme of the course construction, including course system and teaching content, teaching methods, teaching conditions and teaching resources and course teachers etc. The whole scheme has been applied on two hundred students. The students’ interest in learning has increased significantly. The quality of works designed by students has been improved also. The practice of students has proved the effectiveness of our scheme. However there are still problems that need to be studied, for example, how can we better integrate the technical and artistic content in the course?

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