Teaching Research Computer-Aided Design in Art Design Specialty

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Abstract. In art design, the computer can help the designer to calculate, store information, draw and so on. In the design, computers are usually used to calculate, analyze and compare different schemes in order to determine the optimal scheme. All kinds of design information, whether digital, literal or graphic, can be stored in the computer's internal memory or external memory, and can be quickly retrieved; Designers usually start with a sketch, and the heavy lifting of turning the sketch into a working drawing can be done by the computer. Computer can be used to edit, enlarge, shrink, translate and rotate graphics data processing work. Therefore, it is a teaching method that art design teachers must master to master computer technology to assist design. Based on this, this paper discusses the computer-aided design teaching of art design major.

Keywords: Computer Aided Design, Art Design, Practical Teaching

1. Introduction

Today, with the rapid development of science and technology, computer aided art design is a powerful means to promote the development of art design in China. In recent years, computer aided art design technology has been applied to various industries. The core of computer-aided design is artistic design, and the concept of artistic design should follow the following aspects: the form and performance of artistic design should be interdependent; The ultimate purpose of design art is to cater to the market and move towards the market. Art design should strive to outstanding, the development of art should follow the trend of The Times. These are not only the concepts that art design requires to abide by, but also the main development direction of computer-aided art design in the future. But at the same time of the development of computer-aided design, it is necessary to improve a series of human-computer interaction, life cycle, innovation, technology development problems, which is more conducive to the development of computer-aided art design.
2. About computer and art design

With the rapid development of computer technology, computer-aided design is more widely used in the field of art design. With its unique traditional handwork or other tools can not compare the function, effect and high efficiency, to the field of art and design brought a new way of work and visual shock. The most direct contribution of computer to design is to bring new modeling language and expression. The computer can make the design process visual, the image generation process can be effectively controlled, and directly feedback the control effect, can replace the designer to complete most of the rational work, its calculation speed is incomparable to the human brain, The designer's creative intention is quickly converted into visual graphics, and the color, material, lighting, shape changes are more convenient.

3. Accurate positioning, clear learning purpose

The computer-aided design we talk about mainly refers to the use of some computer software as a tool to design and draw, and the software that different majors need to master is not the same. The ability to use computers reasonably and accurately to design can make us reduce the amount of time spent on manual production. When designers master and operate computers, they are proficient in the use of various software and tool effects. Produce a lot of phenomena that are difficult to think of and see. In recent years, most of the works of some advertising exhibitions and various art and design exhibitions have been completed by computer production technology, but we must clearly realize that computer is a machine and a tool, which can help us to complete some regular, complicated and mechanical operations. It can not and will never replace human image thinking. In the design process, man is the first element. Because in the use of computer design, designers need to have the necessary design foundation and aesthetic skills, such as creativity, aesthetics, composition, color and so on, the computer can only make feedback according to the targeted instructions issued by people, rather than learning two or three software to collect the data can be simple and stiff, that is, to create, design and abuse all kinds of computer special effects, to play with production skills, monotonous, similar and lack of personality, this is not our learning purpose. In my opinion, the fundamental purpose of learning and using computer for aided design is to master the learning rules and operation skills of computer software in order to better and more fully convey information and reflect the creativity of design.

As a professional skill that students must master, computer-aided design is often listed as a professional basic course. Through study, students should understand the role of computer as a "design tool" in this subject, attach importance to it and learn it well. Will be conducive to better professional design in the future.

4. A combination of hand-drawn graphics and computer graphics-aided design

Hand-drawing is the earliest means to express designers' creativity, with the advantages of rapid and flexible, modern art design can not be separated from hand-drawing, but also from computer-aided design. With the development and progress of society, we should constantly renew our ideas and accept new and more convenient scientific and technological means to serve teaching. For example, the school can set up hand-painted graphic design at the same time in the stage of computer graphics-aided design. Hand-painted is the necessary means of design expression, the only way to record design inspiration in the first place, and the most direct embodiment of designers' basic skills and artistic accomplishment. In
the design conception stage, first use pencil, pen, watercolor, water powder and other painting tools for hand-drawn design creation, and then use computer processing to perfect and finally map.

The combination of hand drawing and computer can make students have a lot of time and energy to conceive, refine the content and creativity of the works, which is conducive to cultivating students' innovative thinking and stimulating students' creativity. The two complement each other and can achieve twice the result with half the effort. Computer performance drawings and hand-drawn design drawings are all necessary "double-edged swords" for art designers. Our designers should not only have a deep painting foundation, adhere to the training of hand-drawn drawings for a long time, but also operate computer design software skillfully.

5. The Contradiction between Art Design Teaching and Computer-Aided Design

Undeniably, the combination of art design and computer makes this advanced, efficient and shared high-tech fully applied in professional teaching. However, the contradictions and problems in art design teaching and computer aided design in colleges and universities are not optimistic, which are mainly manifested in the following aspects:

![Contradiction between Art Design Teaching and Computer-Aided Design](image)

**Figure 1.** Contradiction between Art Design Teaching and Computer-Aided Design

Because of the powerful design function of computer and design software, many junior students who have just entered colleges and universities have learned professional software prematurely in addition to the public course of computer foundation. They indulge in software operations, gradually losing their enthusiasm and interest in strict basic training. After entering the senior grade, the lack of design thought and poor hand-painted modeling ability in the design process seriously affected the quality of the senior design teaching and graduation design.

In the course design, the students are not willing to do the basic skills training of creation and performance because a large number or even all of computer design and drawing, which leads to the decline of students' quality, which is reflected in the design of their own design program can not be drawn out, no confidence; design lack of thinking analysis process, its completion method is to copy the ready-made effects from the software and piece together, resulting in the screen stiff, rigid, lack of
personality and creativity, so that they become computer prisoners, become mindless, thoughtless simple cartographer, and eventually become other designers drawing tools. When evaluating homework, individual teachers will take the performance effect of graphic surface as the scoring standard, which is not conducive to the development of students' creative thinking.

In the process of part-time or graduation, senior students find that many design companies pay more attention to computer operation ability when recruiting designers, so that many teachers and students only attach importance to computer performance technology in teaching and learning. Despise the idea of design. In order to learn the updated software, many students signed up for the design software in some private computer classes outside the school, but gave up the basic course training in the school. As a result, they only learned the operation of the computer design software when they graduated. But lost the design ability. These problems in front of us should arouse the attention of art design colleges and universities, discuss and analyze these problems, correctly handle the contradiction between art design teaching and computer aided design, strengthen teaching management, unify teaching thought and improve teaching quality.

6. Solution

![Diagram](image)

**Figure 2. Solutions**

6.1. *Strict treatment of basic design training for computer-aided design laid a solid foundation*

Any subject has corresponding basic courses, without solid basic skills can not be said to create, innovation. It is not a matter of one day to cultivate students' rigorous study and acquire solid basic skills. Teaching can not be simply regarded as a kind of knowledge imparting and mastering skills, and more importantly, it is necessary to edify students' quality and accomplishment in the process of imperceptible influence. The basic course of design is mainly to cultivate students' practical ability and aesthetic ability, and to cultivate their creative ability in the process of thinking. The teaching of sketch and color mainly trains students to grasp the contents of form, structure, light and shade, tone and so on. Only by mastering these basic elements can they reproduce their design ideas in computer drawing. For example, using the sketch knowledge learned, when drawing the indoor effect map through 3 DMax,
the position of the camera and spotlight can be placed correctly, and the changes of light and shadow, light and shadow can be processed by means of light and shadow tracking and light energy transmission, so as to fully express the three-dimensional and light sense of the indoor environment. Using the color knowledge learned, the color coordination and image of the whole picture can be made more realistic.

6.2. Promote the teaching of thinking process and provide optional scheme for computer drawing

The process of school education is a process of thinking teaching. By cultivating students' thinking ability, they can observe and analyze independently, think critically, and study comprehensively, so as to cultivate their creative ability. For a computer, its biggest characteristic is that it must give some data and generate accurate graphics through software programs. This feature is not suitable for the conceptual stage. Because when conceived, the data in people's brains may be a vague, uncertain concept, just an impression, a feeling. In order to express the indefinite image of thinking in the mind, it is necessary to change it into a perceptible figure by the design method of graphic thinking, which requires the manuscript to be drawn with bare hands. The hand-drawing process of the manuscript is a thinking process, which does not have accurate data control, but mainly grasps the key points and captures the accidental flash of inspiration in repeated revisions. Therefore, the teaching of thinking process is advocated, and teachers are required to strictly request the quantity and quality of manuscripts in the design class. Only by paying attention to the design process can we have good design results and make the design results better than the design process.

6.3. Arrange the teaching process reasonably.

In order to solve the contradiction between art design teaching and computer and make the design comprehensive course develop in a healthy direction, we should improve the teaching process and teaching content. First, set up the teaching plan reasonably, arrange the design course before the design software study. This is not only conducive to the normal design class, but also enables students to apply what they have learned to computer design. Second. By changing the teaching mode of teaching and homework in the past comprehensive courses, the teaching course is divided into four stages: teaching, designing sketches, computer drawing and homework evaluation, which can not only train students' hand-drawing ability, but also train students' ability to operate on the computer. Third. Graduation design belongs to comprehensive design. It is an effective way to test students' knowledge level and creative ability in four years. Students majoring in art and design can follow the steps of setting the subject, drawing scheme with bare hands, computer drawing, design instructions, digital printing and final evaluation. Only by combining the thinking process with the production process can the graduates be able to do well in the job search.

7. Innovative ways of teaching computer aided design courses

How to carry on the innovation reform in teaching so that the teaching achievement can be improved educator needs to consider. The author believes that there are the following five innovative reform measures.

7.1. Establish module curriculum system to protect professional courses
The establishment of modular curriculum system can be gradually taught in the following courses. First of all, set up computer basic course as the foundation; then teach graphic design software course, cultivate students' graphic design ability, and then teach 3D design software, let students learn computer aided design software from shallow to deep. In teaching, from simple to complex, from plane to three-dimensional, such a degree of difficulty is conducive to students' learning. In addition, the teaching direction of different art design majors is different. For example, environmental art design majors should offer computer-aided design courses such as Photoshop, AutoCAD, 3dsmax. Different art design majors will set up the same auxiliary design software course, which requires the orientation of the professional direction and the emphasis in the actual teaching. For example, Photoshop is a course that many art and design majors need to learn. When teaching environmental art and design majors, they will not focus on the ability to draw and deal with three-digit maps. Instead, focus on how to visual communication of architectural effects and other late effects of presentation and modification.

7.2. Pay attention to design curriculum education, cultivate students' creative thinking

Whether a work is successful or not, the key lies in the depth of thought in the work. This requires that in the actual design teaching, we should not only stay on the improvement of aesthetic taste and the use of design software, but also need to cultivate the students' overall ability. An excellent environmental art design work needs to integrate a variety of professional knowledge, such as urban planning, urban design, architectural design, color relations and so on. Students majoring in environmental art design need to master these knowledge, and colleges and universities should set up these specialties in the curriculum system. When making the syllabus, we should pay attention to keeping pace with the times, train the modern design thinking and teaching work throughout, pay enough attention to the traditional design course, so as to lay a solid foundation of design theory for the students. In order to facilitate the design of the work more design and creativity. In a word, there is no conflict between the teaching of computer-aided design course of art design major in colleges and universities and the traditional design course education, and even the attention should be paid to the traditional design course.

7.3. Pay attention to the innovation of teaching means and expand the way of case teaching

In the early 20th century, Harvard University first introduced cases in teaching and created case teaching method, that is, according to the needs of teaching, to typalize the real situation of practical work related to it. Become a typical case, and introduce it into classroom teaching. Students can learn some practical problems and situations through case study. In the teaching, the students' interactive discussion and research and analysis are adopted to make the students have a sense of working situation, which is convenient to improve the students' ability to deal with the same problems in the future employment.

This teaching method is flexible and vivid, and the explanation of software operation and practical training in the teaching process of computer aided design course is independent of each other in the real sense. Even if students master the operation command of software, they are only learning mechanical skills and do not have the flexibility of design, which makes the teaching effect very unsatisfactory. The case teaching method is very different from the traditional teaching mode. Instead of taking book knowledge as the starting point of teaching, teachers do not explain book moments in accordance with the traditional ten thousand style, but combine knowledge points with real work cases in the form of fusion. This improves students' sense of real work, makes them divergent, and cultivates students' creativity.
Case teaching method will select a typical example, and then strengthen the learning of knowledge points through the processing of examples, so it is particularly important to select examples, and even directly affect the teaching effect of knowledge points. First of all, the selected examples of the application of knowledge points close to the focus of software operations. Secondly, select typical examples and try to select examples with obvious pertinence and enlightening significance. It is also necessary to grasp the transition on the difficulty of examples, from simple examples to complex examples, from shallow to deep, so that the gradual and progressive case selection model is helpful to the promotion of teaching work. At the same time, we should pay attention to the explanation of theoretical moment. Computer aided design software will involve many concepts and nouns. In the process of explanation, we should first combine examples with concepts, further understand knowledge points in practical work case solving, and simultaneously design software operations in learning concepts to increase the interest of education and enhance students' interest. Secondly, it is necessary to increase the complexity of practical training, set up some common situations and situations, help spread the students' design thinking, so as to cultivate the students with high comprehensive quality needed by the society.

7.4. Carry out practical teaching to improve students' practical ability

To strengthen practical teaching, we can adopt the teaching method of "inside and outside class ", that is, the combination of experimental teaching in school and practical teaching in society, which can greatly improve the students' practical ability and level. The use of computer aided art design itself is a practical course that requires a lot of practice. For example, complex software operation requires students to practice repeatedly to master, so "in-class" teaching practice. The practice teaching in the form of school-enterprise cooperation can help students to master the use of design software. Students' practical training in enterprises can not only cultivate their professional thinking ability, feel the real working atmosphere, help to understand the knowledge points, but also help students to clarify their own learning orientation earlier. So that students in the study no longer feel empty, boring.

7.5. Assessment of the learning process, performance evaluation focus on the assessment of comprehensive ability

Teachers pay attention to emphasizing the learning process in the course score, and score the learning process, break the traditional examination of students' scores according to the final examination results, and pay attention to the assessment of students' comprehensive quality and ability. The scoring system is based on the final examination results, supplemented by the evaluation results of the learning process of the usual subjects, and the corresponding total score ratio is formulated respectively. In the actual course teaching process, select some curved comprehensive exercises to be included in the total score of professional examination, set specific scores as part of the total score of teaching, correct students' attitude in teaching and arouse students' enthusiasm in learning process.

8. Conclusion

Computer aided art design has obtained good achievements in each aspect, but along with society's progress and development of computer aided art design both in design and also must carry on the
development and innovation in the design process, the computer aided technology as one of the most powerful tool in art design, it still has some limitations in some respects. For computer aided art design, design innovation is the inevitable requirement and development is the final goal. It is very necessary for teachers to make good use of the computer-aided function in the process of teaching.

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