Application of Computer Aided Design Teaching in Ceramic Product Design Education

Xuan Xie
1 Jingdezhen Ceramic Institute
2 College of Technology and Art, Jingdezhen Ceramic Institute

Abstract: This paper first analyzes the definition and characteristics of computer aided design teaching, then deeply analyzes the application of computer aided design teaching in ceramic product design education, including the application of modeling method, the emphasis of computer aided instruction and the switching between three-dimensional space and real space, and finally expounds how to improve students' computer aided design ability in ceramic product design education. Based on the development status of ceramic product design in China, this paper constantly improves the application of computer aided design teaching in ceramic product design education.

1. Introduction:
With the rapid development of China's ceramic design field, there is a great demand for professional ceramic designers in China, and universities in China are gradually developing relevant teaching courses. Computer aided design is widely used in ceramic design. Therefore, most colleges and universities will carry out courses related to computer-aided design while developing ceramic design courses, so as to enhance students' understanding of computer aided design. Computer aided design is shown by 3D graphics in drawing, so it is necessary to use related software in work. However, most college students are exposed to 3D software for the first time, so developing computer aided instruction in ceramic product design should proceed from students' reality.

2. Definition and Characteristics of Computer Aided Instruction
With the rapid development of computer technology, Internet, big data and other network technologies are gradually entering people's lives, and computer aided instruction, which combines technology with education, has developed rapidly. Using network technology to teach is the meaning of computer aided instruction, which can not only stimulate students' interest in learning, but also strengthen students' training level in practical training. The combination of theory and practice is an aspect that colleges and universities should pay attention to in teaching. Constantly cultivating students' innovative ability, applying computer aided instruction in teaching classroom can not only improve students' ability, but also improve students' learning environment, thus realizing the teaching purpose. Computer aided design teaching is widely used in ceramic product design, which is characterized by simple operation and convenient storage. Computer aided design takes 3D software as the core in ceramic product design. The operation of this software page is relatively simple, which enables students to master the core operation technology in a short time. Compared with traditional drawing technology, drawing with computer aided design can improve and modify information and pictures across time and space. The preservation of storage resources by computers is long-lasting and safe. Sketches made by users through network technology can be preserved in computers for a long time. The stored resources can
be viewed by users anytime and anywhere, and there are many transmission modes, which can complete the production of advertisements and posters. In addition, computer aided design also has strong expressive force. In the application of computer aided design, 3D drawing software is needed. The drawings made by 3D drawing software have strong expressive force, both in terms of color expression and in terms of hierarchy, and have strong simulation on the picture depiction effect. For example, computer aided design drawing software can improve more block materials and improve the expressive force of pictures in the drawing process. In addition, the pictures produced by PS technology have strong expressive force in terms of level and color effect.

Drawings drawn by computer aided design

3. Application of Computer Aided Design Teaching in Ceramic Product Design Education

3.1 Strengthen the overall use of modeling methods
Shape shaping and variety are part of the characteristics of ceramic product design, so different modeling methods need to be applied in the design process of ceramic products. Because of the characteristics of ceramic products, related workers sometimes need to use multiple modeling methods at the same time, so it should be emphasized to strengthen the overall use of modeling methods by designers, so as to maximize the design effect of ceramic products. Non-uniform rational B-spline modeling and mesh modeling are two advanced modeling methods frequently used in the design process of ceramic products. Non-uniform rational B-spline modeling is to realize the automatic calculation of surface accuracy by adjusting the surface curvature of products, and mathematical theory plays an important role in this modeling method. Grid modeling has excellent compatibility and occupies the least system resources, which can realize the rapid operation of the system. The comprehensive use of the above two advanced modeling methods can meet most modeling requirements, but not all modeling requirements. Modeling methods have different advantages and disadvantages according to different types. Therefore, when designing ceramic products, designers should choose corresponding modeling methods according to different types of modeling, which can maximize the design effect of ceramic products. For example, the candle model in ceramic product design does not require too much use of modeling methods. However, if the designer uses a modeling method to complete the candle model, it will not only make modeling more difficult but also require longer time. Therefore, the designer should pay attention to the comprehensive use of modeling methods when making ceramic products.
3.2 Highlight the Key Points of Computer Aided Teaching
3D software is a large drawing software in China, which involves many commands in the production process, and it is difficult for users to remember. In addition, 3DS MAX drawing software is also faced with the problem of more sentences and commands in the production process. 3DS MAX is a drawing software developed abroad, so English is used in the process of downloading the software, configuring the installation environment and later using it. In addition, hundreds of commands are involved in the drawing process, which will strengthen students' learning difficulty and make it impossible for students to remember the operation commands for a long time. A survey on the teaching situation of related courses in colleges and universities shows that some students forget the operation commands after the teachers teach, and some students can remember the operation commands within three days after the teachers teach, which will seriously affect students' interest in learning over time. Based on the above teaching situation, teachers can translate English in the page layout when explaining the operation commands involved in 3D software, so that students can fully understand the meaning of each control and each operation. Because there are many related operation commands, but there are few commonly used commands, teachers can highlight the important commands in computer assisted instruction in teaching, and simply introduce the commands that are not applicable, thus reducing the commands that students need to remember and improving students' interest in learning.

3.3 Switching between three-dimensional space and real space
Three-dimensional space is a difficult part for college students in the course of ceramic product design. As one of the widely used drawing software, 3DS MAX also needs to apply three-dimensional space, especially coordinate system, so most students often confuse coordinate positioning when learning the chapter of three-dimensional space, which leads to difficulties in the drawing process. The above situation occurs in teaching, often because students can't switch between real space and three-dimensional space, which leads to the inability to accurately define the volume and size of the model in the process of modeling in three-dimensional space for learning, thus making it impossible to establish a complete model. According to the above problems in teaching, teachers can change the teaching methods in the course of ceramic product design, and explain the concept of plan to students in detail, so that students can have a certain understanding of three-dimensional space. When learning 3DS MAX software, we can use the Screen coordinate system, which is similar to the 3D coordinate system but easy for students to understand, to strengthen students' understanding of the coordinate system and understand its operation process. In the teaching of ceramic product design, teachers should focus on cultivating students' concept of switching between real space and three-dimensional space, so as to successfully complete the establishment of the model.

4. Methods of Improving Students' Computer Aided Design Ability in Ceramic Product Design Education
4.1 Cultivate Students' Innovative Ability
Cultivating students' innovative ability will not only improve students' computer aided design ability, but also help students in ceramic design in the future. The traditional teaching method in colleges and universities in China is that teachers give priority to teaching and students follow the pace of teachers. In order to improve students' innovative ability, teachers must change the teaching method and make students become the center of the classroom. For example, teachers can intersperse pictures, audio and other materials consistent with the teaching content during the teaching process, so that students can actively join the classroom; In addition, teachers can add questions in teaching, which not only makes students actively participate in classroom teaching, but also makes students use their imagination to answer questions, so as to stimulate students' innovative ability and improve their computer aided design ability in ceramic product design education.
4.2 Improve Students' Application Ability
Combining theoretical knowledge with practice is the most important part of computer aided design teaching. There is a big difference between theoretical knowledge learning and practical operation, so teachers should pay attention to students' application ability in computer aided design teaching. Only by using both eyes and hands can professional skills and creative thinking ability be improved rapidly. In addition, teachers can adopt "task-based teaching". Teachers can take examples of enterprises as teaching tasks and let students complete tasks alone or in groups, so that students can take the initiative to learn theoretical knowledge and practice, and find, solve and raise problems in the actual operation process, thus improving students' hands-on operation ability and increasing students' interest in computer aided design teaching, thus promoting the development of students' application ability.

5. Concluding remarks:
Computer aided design teaching plays an important role in ceramic product design. Drawing with 3D software is the most important and difficult part in computer aided design. The application of 3D software requires designers to have a deep understanding of 3D space. Therefore, in the teaching of computer aided design in colleges and universities, teachers should pay attention to the application of teaching methods, adopt various teaching methods and use multimedia teaching in teaching, so that students can actively participate in classroom interaction. In addition, teachers should teach students a variety of modeling methods in teaching, and strengthen students' comprehensive application of modeling methods.

References:
[1] Jia Jing. Application of Computer Aided Design Teaching in Ceramic Product Design Education[J]. Business Stories, 2015(28).
[2] Zhang Sancong, Jiang Xi. Teaching Analysis of Computer Aided Ceramic Product Design[J]. Charming China, 2013.
[3] Gao Ying, Huang Shan, Jiang Xiaolan. Application of Computer Aided Design in Industrial Ceramics[J]. Computer Knowledge and Technology, 2008.
[4] Zhang Meiling, Huang Yang, Lu Rongjian, etc. Research Progress of Computer Aided Design/Manufacture of Machinable Ceramic Materials[J]. Academic Journal of Pla Postgraduate Medical School, 2018, v.39;No.226(02):88-90.
[5] Dong Bingyang. Application of Computer Aided Design in Industrial Design Teaching[J]. China Educational Technology & Equipment, 2018, 000(014):26-28.
[6] Wang Xin. Application of Computer Aided Design in the Design of Domestic Ceramics[J]. Art Fashion: Theoretical Edition, 2013(10):58-60,2014(10):94-94.
[7] Zeng Jing. Advantages of Computer Aided Design in Ceramic Art Design[J]. Arts In China, 2014(10):94-94.