Study on Influence of Computer Technology on Teaching of Art and Design Course

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***Abstract*—The Application and rapid development of computer technology in art and design field have significantly influenced modern art and design education in China and also have resulted in a comprehensive change to mode of design teaching, content of design teaching and even concept of design teaching in art and design education. Development of computer technology in art and design course teaching, especially its application in graphic design, has become an issue worth exploring in depth.**

Keywords—computer technology; art and design; graphic design; aided design; teaching; reform

I. INTRODUCTION

Rapid development of computer technology brings about the revolution of information technology and makes the human society step into an information era; development level and education level of computer technology have become an important symbol of social progress. Over more than 20 years, the application of computer technology in art and design field has been greatly developed. In review of Chinese history of modern art and design education development, introduction of computer technology in 1990s was undoubtedly of epoch-making significance. Rapidly developing computer technology and computer graphic design have greatly influenced modern art and design education in China and also have resulted in a comprehensive change to mode of design teaching, content of design teaching and even concept of design teaching in art and design education. Today when computer is a design tool and even a design culture, it has become an indisputable fact that basic knowledge and basic capacity of computer has been an important part of knowledge structure of the students of art and design major. Due to its outdated contents and source of computer professional teaching, from the very beginning computer teaching for non-computer majors in a comprehensive university is just the concentrate of computer professional courses and ignores actual condition of art and design major, development of computer technology in art and design field, classification guidance in basic computer education in art institutes of higher learning, concern on the condition of teaching hardware and comprehensive and correct understanding of development direction of computer aided design, which is adverse to development of computer art and design teaching and cultivation of art and design talents. Therefore, development of computer technology in art and design course teaching, especially its application in graphic design, is an issue worth exploring in depth.

II. THE ORIGIN OF THE APPLICATION OF COMPUTER TECHNOLOGY IN THE DESIGN

Application of computer technology in graphic design (Computer Graphic, CG) derived its origin from America in the early 1960s and was not brought to Chinese design application and design education in the middle 1990s, therefore, there is an obvious gap between China and Euramerican developed countries in terms of length of time of computer technology development or in terms of breadth and depth of computer graphic application. In this period, within the scope of computer graphic software, there is also a wide gap between high-end and low-end graphic software. High-end 3D software, such as Softimage, Prisms (Houdini now) and Alias/Wavefront (Maya now) had superior performance, but its price was very high and its must run on a working station with same high price and superior performance due to its performance and rendering speed requirement, while low-end graphic software was more user-friendly and much cheaper, though its overall performance was not so good. So the software the earliest promoted and applied in construction and interior design industry in China was Autodesk's AutoCAD and 3DStudio the only one able to run on PC at that time. Compared with high-end software, SD Studio was really elementary in modeling, animation and rendering, and performed less effectively and slowly in rendering, the design sketch it made generally needs massive post-processing in Photoshop. Meanwhile, craftsmanship, as a basic performance of Chinese art and design education, was stepping into a mature stage in its development and had reached a relatively high level. Because performance of 3DStudio at that time was not definitely astounding, the whole art and design education field still maintained a cautious attitude toward this kind of low-end computer graphic software though it had been promoted and applied in domestic design industry to some extent due to its certain expressive force and convenient usage.

However, with rapid improvement of performance of the computer graphic design software, the development speed

has been beyond people's imagination. In 1996, 3DStudioMAX was transferred to Windows platform from DOS platform of 3DStudio. Relative to 3D Studio, 3DStudioMAX obviously had a qualitative leap in its performance and its performance was constantly improved along with constant promotion of upgraded version each year. Meanwhile, upgraded versions of 2D mapping and graphic software such as CorelDRAW, FreeHand and Photoshop also started to show their strong performance in graphic design. So computer graphic design naturally stepped into Chinese design education field.

III. The Impact of Computer Technology on the Teaching of Art And Design in Our County

What the computer graphic design technology first showed when it started to step into Chinese design education field are aided design-based features. Professional design courses of many design majors have been greatly changed due to application of computer graphic aided design. In architectural design field, promotion and popularization of AutoCAD have basically deserted traditional mapping tool and traditional graphic mode. Previously the designers bended over a table or used a ruler template or a blade to draw and revise drawing contents irrevocably, and now heavy and wide mapping platform has been completely replaced by a small computer. In environmental art design and industrial design major, computer graphic drawing has become a compulsory course of the students and 3DStudioMAX has become a kind of 3D graphic software the most widely applied in aided teaching. For graphic design major, computer graphic aided design runs through the whole process of packaging decoration design, advertising poster design and CI advertising design and wide application of Coreldraw, FreeHand and Photoshop has basically replaced freehand sketching function.

IV. The Impact of Computer Technology on the Teaching Modes and Methods

Another important change brought by increasingly common computer graphic aided design is reform of teaching mode and teaching pattern. Multimedia teaching pattern has become a kind of inevitable trend. Compared with one-way traditional cramming method, more intuitive and open multimedia teaching is obviously more suitable for teaching and expression of modern design theory and concepts. Multimedia teaching also makes network teaching possible and opens a wider space for the students through Internet, and through this space media, the students can get up-to-date knowledge and resources, at the same time, the students' homework can be uploaded with internet so as to expand the students' judgment coordinate to a wider scope from a narrow group.

Based on development of modern high technology, computer graphic design technology has been widely promoted and applied in China in a few short years, so why can the computer graphic design rapidly replace traditional craftsmanship? By comparing traditional craftsmanship with computer graphic design, at least some problems may be explained in the literal sense.

We can do a simple comparison between the method of hand-painted interior and architectural renderings and the method of architectural renderings with computer graphic software. For example, for a repeated object and element, computer graphic design and manual painting are obviously different, the replication or array function of the computer graphic software is obviously more efficient than repeated painting by hand. Perspective (especially complicated three-point perspective) is the most difficult one in hand-painted rendering, while in computer graphic design, camera setting makes complex perspective very simple and you can get a satisfying design by randomly adjusting position and angle of view of the camera. Relative to hand-painted watercolor, gouache or painting techniques, computer graphic design can achieve a more vivid visual effect. Material editor using computer graphic design software can produce various materials you need; by light setting and deployment, you can get a vivid lighting effect; by opening rendering command when everything has been set up, the computer will automatically render the graphic. For the final background, manual pasting will generally leave obvious artificial trace, but computer graphic software will make the work to achieve a better effect after seamless integrated treatment. Of course, perhaps someone may cherish artistic conception of hand-painted work, but the rich and vivid effects created by special effect techniques of computer graphic design (for example, fire, light and smoke, etc.) are really incomparable to hand-painting technique.

The above comparison may only show representation feature of the thing, but relative superiority or inferiority of these two kinds of design modes is clear, which is helpful to understand why in professional design courses traditional hand-painting technique has been almost completely replaced by computer graphic aided design.

V. The Development of Technology Putting Forward New Requirements for the Class Teaching

However, we shall note that the role of computer graphic aided design in improving production efficiency and changing quality of visual effect of the works only involves shape and appearance of the design content and the immaterial, software and invisible value change brought to modern society by computer graphic design is the key of our exploration: "involvement of design principle and definition in design content" beyond the pursuit of modeling, coloring and texture is the basic target of our pursuit. But, to do this, we still have to make great endeavor and some subjective and objective problems are becoming a serious resistance, so in pursuit of the basic target we shall focus on studying and solving the following problems.

Firstly, we shall note that sustainable development of computer graphic design technology constantly raises new requirements while providing solid foundation for our pursuit. Based on impact of high-end software and constant upgrading of existing software, our teaching plan and contents must be inevitably adjusted, how to select a

professional graphic design software applicable to multi-level teaching in massive computer graphic design software has become a new topic in existing design teaching. We shall not restrict the students to low-end or middle-end scope because of the inertia and thus make the students miss the opportunity to integrate with high-end technology in the world. Thought it is impossible to let the students grasp too much computer graphic software, it is not only possible to let the students grasp general common software and grasp at least a kind of high-end software, but necessary to improve the level of computer graphic aided teaching.

Appearance of high-end software also catches our attention to the condition of teaching hardware equipment. Backward facilities have seriously hindered computer graphic aided teaching and hardware equipment is the most important material basis for computer graphic design teaching, without this solid foundation, improvement of computer graphic aided teaching level may be just a hollow phrase. To strengthen upgrade and construction of hardware equipment has become an urgent task for current computer graphic aided teaching.

Secondly, we shall also pay attention to cultivation and improvement of teaching staff. Now it is still a very common phenomenon that some professional design teachers do not know how to use professional computer graphic design software and it becomes more and more difficult for them to grasp software because of constant upgrade of design software, thus the phenomenon becomes more and more prominent. Separation of full-time teachers of computer graphic aided teaching and professional design teachers has resulted in disconnection of design teaching to some extent. In fact, computer graphic aided teaching has exceeded the range of pure aid or pure production and is becoming an important creating means. Basic software operation that the students learn and grasp in computer graphic aided course is very important, but in professional design creation, how to develop and apply software functions is more important. If the students get few instructions from a professional design teacher in doing homework with 3DStudioMAX or Maya, the teaching level and teaching quality will be greatly reduced. We do not deny that this phenomenon results from many objective factors, for example, years of graduation of the teachers (1980s and early 1990s isolated from computer), language environment (a certain foreign language ability is also needed in grasping a software, and all the more so for high-end software), and even information and regional difference. But anyhow the condition shall be properly improved and we must take some practical measures to popularize computer operation. To some professional teachers, they are not lack of artistic quality at all, professional theories and experience, instead, they are only lack of a period of time and a process to learn professional design software, and once the bottleneck is broken through, they will inevitably become the backbone in developing computer graphic design art in China. On the contrary, if our teaching staffs stay at such a level, it would be very difficult for us to close the gap between us and advanced countries when we have lost the cutting-edge of time.

VI. CONCLUSION

Finally, the issue concerning us and the most worth our attention is a comprehensive and correct understanding of development direction of computer graphic design. Based on development direction of computer graphic design, while improving the level of computer graphic aided teaching, we must start to develop and study the value of computer graphic design, broaden overall view of design education direction and fill in our blanks in major setup so as to contribute to overall improvement of Chinese computer technology in graphic design teaching and let our modern art design play a more important role in promoting our economic and cultural development.

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