THE APPEARANCE AND CONNOTATION: RESEARCH ON APPLICATION OF 3DSMAX IN THE ARCHITECTURAL DESIGN TEACHING

[1]TANG HONG，[2]SHI YAN-HONG

[1] Assoc. Prof., Henan University of Urban Construction，Hennan,China
[2] Lecturer , Henan University of Urban Construction ，Hennan,China
E-mail:[1]tanghong969@126.com，[2]shiyh613@sohu.com

ABSTRACT

With the social development and the advancement of technology, the rendering of real performance is becoming increasingly needed in the construction field.   However, the traditional techniques is difficult to perfect the performance of the designer's intentions. This article introduced 3DSMAX software into architectural design teaching, discussing the origin of 3DSMAX software, creating process and application skills and so on. It also discussed how to enable students to quickly and easily master the 3DSMAX software to perfectly reflect the designer's design idea and true intentions through the software and thus to enhance the overall performance skills of students.

Keywords: *3DSMAX, Architectural Design, Architectural Renderings, Performance Skills.*

1. INTRODUCTION

Architecture accompanys the whole process of human growth and development, from the initial cave, shelt to the classical architecture of ancient Egypt,ancient Rome,ancient Greece, through the brilliant Renaissance to the complex architecture style in the modern society, different architecture style in the different periods reflected different customs,technology,culture,economic,political   and social development in the different times. From a hut to a square, and a city planning, all those are closely linked with our human life, we need building, we have to create building, and the building needs to be adapted to human needs and social development. It is necessary that the form and function of architecture develop in humans continuing social practice. To understand architecture scientifically is beneficial in promoting the range of architecture philosophical thinking. Only in this way can we face up to the problem of architecture existence, and how to solve problem correctly. Without good living environment for people work and live, we can't achieve the grand blueprint of harmonious society.And building design, drawing, the three dimensional simulation is with the aid of computer software to implement the operation. Computer architecture performance easily modified and stylization operation brings convenient which win the general design workers and the design professional teachers' and students' favour. 3D effect is undoubtedly the most easy to understand the designer's intent, in many 3D model software ，3 Dmax was making very practical architectural rendering 3D design software, if used properly, it can provide excellent show means for architectural design.

2.   3DSMAX SOFTWARE

With the rapid development of architecture and related industries, human needs of indoor and outdoor architectural renderings are increasing in all the time. During the earlier time, it is mostly the floor plan, elevation plan, section plan and hand drawing rendering. Although it can show the space location after the construction finished completely and harmonious situation of surroundings,the eventual effect is always different with the previous draft, or at opposite poles[1]. However, the rapid development of computer technology skills solved this problem for people. The excellent three-dimensional animation is appeared to make software, the realistic architectural renderings and animation make people have straight awareness before breaking ground, and can better understand the designer's intention (Figure 1).

2.1   The Origin of 3D Studio Max

3D Studio Max, is often called 3DSMAX or MAX for short, it is a three-dimensional rendering and animation software developed by Autodesk company based on pc system. The predecessor of 3D Studio series software based On DOS operation

Figure1.   The Architecture Rendering Made By
3DSMAX

system,the latest version is 2011.Before Windows NT, the CG making of industrial grade was dominated by SGI graphics workstation. The appearance of 3D Studio Max + Windows NT combination lowered the making difficulty of CG, the preferred begun to use animation in computer games production, then made a further step in taking part of making specialized film on movies, such as X-Men II, The Last Samurai, etc..

2.2   3D Studio Max Application Areas

3D Studio Max is a three-dimensional animation making software which is used in most fields by most people in the world. In the application field, it is widely used in advertising, film, industrial design, architectural design, multimedia making, games, assisted teaching and visualization project fields, etc..3DS MAX which has a power function, is widely used in television and entertainment industry, such as animation open and video game making. The role -Laura deeply rooted in players' heart is a masterpiece of 3DS MAX [2]. It also applies in Motion Pictures &Television. Whereas, in our country, architecture rendering and architecture animation production are relatively mature, 3DS MAX utilization ratio has definite advantage.

2.3   3 DStudio Max advantage

3D Studio max is pure 3D software, the biggest difference between it and the 2D and 2.5D software on the market is in the calculation of the processing. Three-dimensional operation is a bit complicated, but the effect is positive, and the real delicate,able to do high simulation degree. And the general 2D software such as AutoCAD, although also can do some 3D demonstration model, but its calculation is just stay on line level, fast but not the effect. And in SketchUp, its the biggest characteristic is to have a unique method, can realize two-dimensional three-dimensional rapid transformation, but it isnot as good as CAD in 2D and didn't perform as 3 dsmax exquisite and true in 3D.Apart from the plan itself，architectural design final result still should pay attention to the later rendings. A good design

concept is to only myself can fully interpret, so designers in addition to improve the design also must be skilled in 3D performance, so the introduction and guidance in architectural design teaching process to 3D Studio max is particularly important.

3. 3DSMAX APPLICATION IN ARCHITECTURAL DESIGN TEACHING

3.1 3DSMax Makes Architectural Renderings is a Necessary Skill for Architectural Students

As foro students majoring in architecture, it is a necessary skill for themto grasp 3DSMAX computer renderings proficiently. The computer renderings can be helpful to professional design and construction programs bidding, it can express the designer's intention to the building construction units and construction units and the public, it also can predict the actual result of completed architecture. Therefor, it is very important for the designer to have a rendering which has accurate expression,unique design and infection (Figure 2).
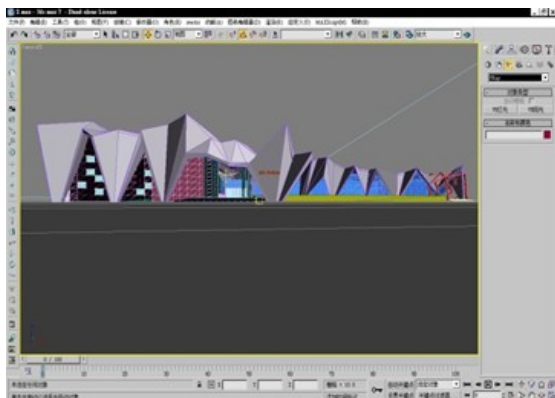

Figure2.   Architecture Modeling Made By 3DSMAX

3.2 Let Students Fully Understand the 3DSMAX Application Fields and Development Prospects

Before teaching, we should let students understand the 3DSMAX applications field, and guide students to integrate their own situation, clarify learning target and direction to select appropriate application field, and niche targeting studying. Then, they can lay a good foundation for employment.

In the teaching process, you should fully introduce the development prospects of 3DSMAX to the students, to improve students' learning desire determination in learnning. As a teacher, you should always pay attention to related industries and dynamics of surrounding industries, update knowledge on time and continuously improve our own professional knowledge. On this basis, during teaching, you need combine the market prospects of industries with knowledge appropriately, let the students grasp knowledge as well as getting to know the development direction of industries, so as to effectively combine theory and practice.

3.3 Stimulate Students' Interest in Learning 3DSMAX

1) Promote an example method

There are numerous 3DSMAX operating panel, the production steps are not easy to remember. To enhance students' interest in learning, educators should use more examples in the teaching process. By vivid examples bring out the knowledge, thus enabling the teaching process easy to understand, progressive approach, in order to promote teaching interaction, improve students' interest in learning and active thinking.

2) Let students get rid of books

Many students have the habit of looking at the book, according to the book to complete the work. After abandoning the book, they do not know how to make the next step. Therefore, they have developed bad learning methods of relying on books. This makes the students lack of creativity, only make examples of the books in accordance with the steps in the book. But even use the same knowledge, they

can't create their own design work. As a teacher, you should take a lot of examples when you tell knowledge, let students strengthen the understanding of software features, encourage students to get rid of books and design their own works. After several times of training, students will be used to first creation and then produce model, continuously improve the hands-on ability.

3.4 By Comparison, Deepen Understanding

In the process of teaching, show students the difference between 3DSMAX and similar software .For example: CAD mainly solid and surface modeling.Before version 06, solid modeling method is very simple, the main is a rotary stretch (along the diameter angle etc.) plus cloth and operational entities and edit toolbar.what can be done is the regular geometry deformation, and the general modeling when viewed from the local start, for example a complex geometry, can be split into a number of blocks, and then separately built each, do Boolean operation.The geometry modification is not very convenient, unless you understand the real Edit Toolbar thoroughly.In CAD modeling of high dimensional requirements, it produce object.unless you have size.

3DSMAX mainly in the polygon mesh.3D modeling method is quite rich, including four basic modeling methods of professional 3D software: stretching, rotating, lofting, sweep, and extremely rich edit modifier.The same model modeling method also has a lot, start from the local , you can also add modifier to the model editor.Because the edit means rich and retained the modeling process, the modification of the model is relatively simple.And while modeling for size requirements is not very high.On the explanation and comparison process, deepen students' understanding of 3DSMAX, in order to find the most suitable modeling method.

4. RENDERING PROCESS OF CREATING ARCHITECTURAL RENDERINGS BY 3DSMAX

The creation process of drawing architectural renderings by 3DSMAX is divided into the following phases: model creation stage, the material creation stage, lighting creation stage, the rendering stage, and the post-processing stage. Designers create the general framework by 3DSMAX first, and then make photometric rendering in the plug-VR of the 3DSMAX software, in order to achieve photo-effect software, and finally use PHOTOSHOP for the post-processing.

4.1 Model Creation Stage

Model creation is the three-dimensional building model process in the three-dimensional environment. Before modeling, you should analyze the mutual position of the whole building and the detailed structure according to the designed engineering drawings and understand the side effects expressed by the rendering. Ensure the rendering's main express orientations to improve efficiency, when we produce the building, we do not need to express all details but mainly express the part we can see(Figure 3). Generally we divide the model into several separate structures, and then conduct further independent structure segmentuntil we can set up the smallest unit via adopting a single modeling approach. In 3DSMAX, there are many ways to create the model, including three popular modeling methods:network modeling, patch modeling, curve and surface modeling, the one we often use in architectural rendering is the most widely used network modeling.
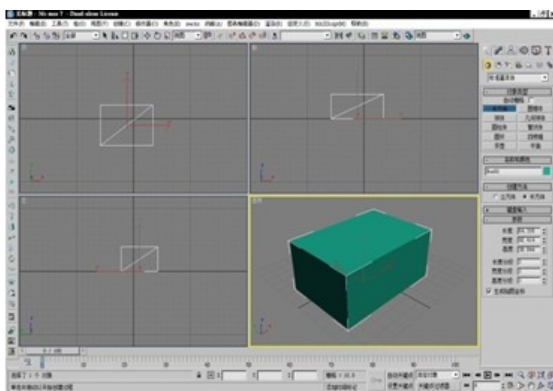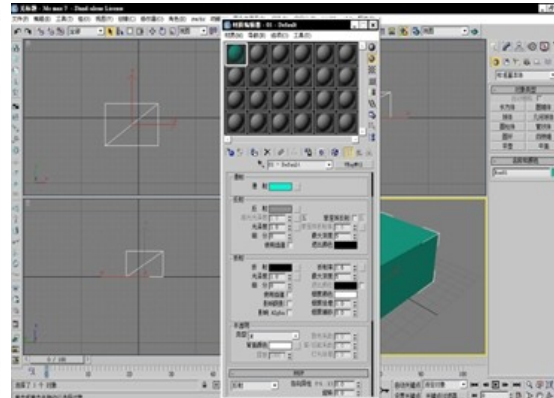
Figure3.   3DSMAX Basic Interface

Figure 4.   3dsmax Material Edit

4.2 Material Creation Phase

The model completed by modeling commands should be the relevant material required by the model, without the material, you will get serious distortion. With the ideal material for the model, we can express any texture effect we want, such as metal, marble, wood, glass and so on. 3DSMAX itself has dozens of material libraries which has been edited. The architectural students can also downloaded some building material libraries commonly used in 3DMAX on the network. They contain some materials often used in daily life and architectural design [3]. Parameter settings for each material are general. We can use the parameters settings by the material with their own experience for reference. Then you can make more types of material effect. Make material library more extensive to meet different models, and to achieve different effects（Figure4）. For the material we can also combine with some of the graphics processing software, such as PHOTOSHOP, COREDRAW, directly produce the material, then adjust the objects through the material editor.

4.3 Lighting Creation Stage

Lighting plays a significantly role in the rendering performance. The object's three dimensional structure is performed through the light. Therefore, during any operations, it requires a detailed set of lights. Lighting settings determine the effect of the whole scene. Scene lighting is usually divided into three types: the key light, additional light and background light. In one scene, the main light source is usually referred to as the key light [4]. The key light is usually the main light source placed in the first place. Use it to create the initial lighting in the scene, although the original lights provide a good way to illuminate the object. However, the result of rendering is monotonous and dull image, shadow effects are usually very rough and too obvious, and the scene always looks too dark. The reason is that there is no natural ambient light to highlight the results of the shaded area. Fill light add the dark scenes and shadow areas. It provides light depth of field and true feelings. The more important natural light is from the diffuse reflection. This type of light is commonly referred to as ambient light. The reason why the ambient light is very important is partly because it increases the brightness of the scene. Most of the ambient light unified applied to the entire scene, reducing the overall dark scene degree. Background light is usually used as the edge light, through the edge of the illuminating target

object separated the object from the background, it is often put in the three quarters of the key light, it works on the opposite edge of the object, then causes a small work zone of high reflectivity[5].If the three-dimensional scene models consists of many small rounded edge , this high light will increase the credibility of the scene.

4.4 Rendering and Post-Processing Stage

Rendering renderings created throughout the whole process of modeling the real need to observe the creation of rendering effects in order to understand the actual results of operations. The ultimate effect of rendering is for the entire map to create a key step, which directly affects the success of the design results, the so-called make or break. Under normal circumstances through modeling, giving material, to set the lights, we will first plug through the native renderer or renderer plug-in for rendering (Figure5). Currently, there are many popular three-dimensional rendering plug-ins available in the market, they have their own advantages, in terms of the expression of architectural renderings, VRAR renderer is one of the best. Its rendering realistic effects, stunning photo-texture [6].
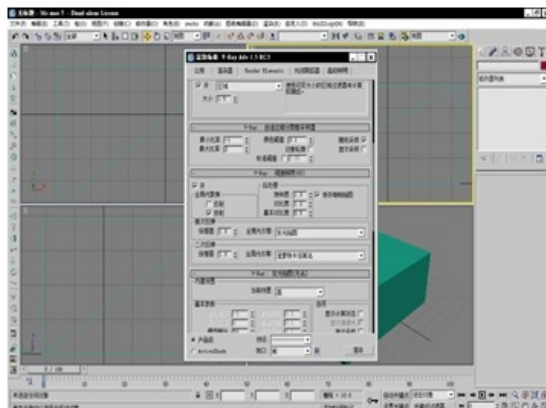

Figure5.   Rendering Scene Dialogbox

5. CONCLUSION

With the social development and technological advances, the needs of realistic rendering are increasing in architecture industry. The 3DSMAXA came into being in this case, with its powerful three-dimensional modeling capabilities, rich extension, easy to use, convenient and efficient use experience quickly win the majority of architectural designers. For an architecture student, they should be aware of 3DSMAX when they are in school, use 3DSMAX, and master 3DSMAX. That should regard this as an essential skill They should combine 3DSMAX and construction work perfectly.If treat it as a necessary basic skills, students can express their design intention better in the fierce competition in the future employment and more competitive with the perfect combination between 3D smax and construction.

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