

# Research and Application of the Multi-dimensional Space Transition Training Method in the Course Form Composition\*

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**Abstract**—Form Composition is a professional basic course of art design, which can reflect the knowledge and value of form composition in every field of utilitarian design, and form composition serves as a connection link in design. Under the new situation of education, art design education is facing deeper reform and extension, which requires new improvement and development of the course Form Composition. For this purpose, this paper makes an in-depth discussion and research on the teaching mode and method of Form Composition from the perspective of teaching reform, and verifies the remarkable teaching effect of the Multi-dimensional Space Transition training method in the course Form Composition based on the teaching practice of more than three years.

**Keywords**—multi-dimensional space transition; form composition; two-dimensional; three-dimensional

## I. INTRODUCTION

As a design basic course for visual communication majors, Form Composition is an important link to train students to transit from painting to designing, from concrete thinking to abstract thinking and from two-dimensional to three-dimensional space. The course helps students understand the composition elements of form and the pattern of its composition methods, encourage them to seek the possibility of form in the known causes and help them improve esthetic conception, develop spatial sense, explore design thinking and inspire originality. Therefore, this course is the rudiment for students to form design philosophy. Form Composition includes three major parts, that is, plane composition, color composition and stereoscopic composition. Form Composition is a basic course of art design in colleges and universities, so you can find its knowledge in each design field, and the mastery degree of the knowledge of form composition directly affects the effect of practical design. In addition, Form Composition serves a connection link in design, which makes it a necessary course that shall be grasped by students. Besides, Form Composition covers a broad scope of knowledge and involves the form, picture composition of a picture, relationship among black, white and gray and color relations,

as well as the form, volume, space, material, craft, layers, light and shadow relating to three-dimensional design.

## II. ANALYSIS OF THE COURSE FORM COMPOSITION

### A. Plane Composition

Plane composition involves form combination and composition of two-dimensional plane spaces. Plane composition is not characterized by representation of specific objects, but reflects the regularity of the movement and change of natural phenomena. It has two characteristics. First, plane composition is based on intuition. Plane composition does not mean to simply imitate specific object forms, but, based on intuition, emphasize the law of constitution of objective reality to decompose, combine and change the complex forms in the nature with the simplest points, lines and planes. Second, plane composition is a conscious and intentional re-creation process that highly emphasizes on rational activities. Plane composition uses mathematical logic, visual response and visual effect to redesign and form the spatial depth to present the graphic effect beyond time and space. Main forms of plane composition include point-line-plane image composition, repetitive composition, approximate composition, variation composition, gradual change composition, emission composition, gathering composition, contrast composition, texture composition, space composition, deconstruction, reconstruction, etc. Such task training is expected to effectively develop the creative thinking and aesthetic judgment ability of students.

### B. Color Composition

Color composition studies the creation of color combination based on the color science system, which is in line with people's perception and psychological principles. That is, it reduces complex visual surface phenomena to the most basic elements, then discovers the variability of colors in quantity and quality and in space by using the principles of psychophysics, and grasps and creates new and ideal color effects according to certain color rules. In color composition training, to realize a profound and overall understanding and mastery of color theory knowledge, it requires to study the elements of color from physics, study the visual law about color from physiology, study the feelings, associations,

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symbols, hobbies, meanings, impressions of colors from psychology and study the configuration, coordination, function and beauty of color from aesthetics. Main forms of color composition include color attribute, color space mix composition, color contrast composition, color harmony composition, color collection composition, color psychology, etc.

### C. Stereoscopic Composition

Stereoscopic composition is an activity that starts from the standpoint of form elements, studies the pattern for creation of three-dimensional forms and effectively utilizes abstract materials and simulated structures to create pure forms. Similar to other types of composition, stereoscopic composition is a kind of thinking training, which, on the basis of a new idea of modeling, explores the essence of form and shape of modeling, develops and improves the performance skills of three-dimensional forms through skillful utilization of the material media, and focuses on developing students' creative ability and aesthetic ability through logic thinking training. Main forms of stereoscopic composition include two-and-half dimensional composition, point stereoscopic composition, line stereoscopic composition, plane stereoscopic composition, block stereoscopic composition and group comprehensive composition, etc.

## III. NORMAL TEACHING MODE OF THE COURSE FORM COMPOSITION

The course Form Composition is classified according to the dimension, and the teaching sequence is from plane composition to stereoscopic composition. Plane composition includes figure composition and color composition. Normally, plane composition, color composition and stereoscopic composition are explained in three different teaching stages. First, we have to solve the problem of form and modeling of plane composition in two-dimensional space. Color composition is to solve the color relations among forms in two-dimensional space and the color psychological expression, while stereoscopic composition is to solve the organizational relationship among forms in three-dimensional space. If the three major types of composition are explained and trained in stages, it is easy to isolate the connection among them, lead students to mistake them as three independent courses, and cause a break point in the connection of plane composition and color composition in two-dimensional thinking mode and the creation of required three-dimensional stereoscopic composition. Thus, this will make it difficult for students to find and flexibly use the inner regularity among the three courses. Especially, in making stereoscopic composition works, students feel it is hard to create works in line with the law of composition, with sense of form and sense of layer. In addition, most stereoscopic composition practices are improvised, so the cohesion and combination among volumes are completely casual. As a result, most of the works are knocked together or too simple. Students fail to conceive and plan before creation, so their works lack the sense of wholeness.

## IV. METHOD OF MULTI-DIMENSIONAL SPACE TRANSITION TRAINING

### A. Concept Definition

Multi-dimension is the collective name of two-dimension, two-and-half dimension and three-dimension. In the whole course of form composition, plane composition is two-dimensional composition, including research on black and white and color research. Stereoscopic composition includes two-and-half dimensional semi-stereoscopic composition and three-dimensional composition. Transition training method refers to using task training to help students transit from two-dimensional plane to three-dimensional production expertly. There is a certain association between plane works and three-dimensional works, and we can say plane works are the planar effect picture of stereoscopic works while stereoscopic works are the representation of finished products of plane works. In teaching, plane is usually before the stereoscopic ones, but in practice, students rarely realize the knowledge of form composition is a whole. Therefore, we need a training method that can link two-dimensional composition, two-and-half dimensional composition and three-dimensional composition together to form a topic to study. Through this training, students can find a point linking two-dimension, two-and-half dimension and three-dimension and form a knowledge system architecture in their brains so as to make a whole set of works transiting from plane to stereoscopic ones.

### B. Concrete Method

1) *Adjusting the teaching sequence of plane composition, color composition and stereoscopic composition:* That is, after the adjustment, the teaching sequence is plane composition, stereoscopic composition and color composition. Plane composition and stereoscopic composition have a lot in common in the teaching content, such as in the organization and psychological implication of point, line, plane, rule of formal beauty of composition, organizational form of composition and so on; the difference between the two is that stereoscopic composition consists of volumes and blocks, thus involving research on volume and space. Due to the common points between the two, they can be put together to design homework topics.

2) *Space composition is the pointcut connecting topic setting of plane composition and stereoscopic composition:* In order to help students create better stereoscopic composition works that are based on certain rules and to enable students to make better combination between plane and stereoscopic knowledge through a training method, it is very important to find a pointcut for such combination. The knowledge system of plane composition is to solve the modeling problem of length-width two-dimensional space, which is characterized by planarity, so only by finding a knowledge point that can lead to spatial stereoscopic visual effect on the plane paper, can we connect plane with three-dimension. Space composition in the forms of plane composition just meets the condition of a pointcut. Space is an objective form of material existence, and the space we generally talk about is three-dimensional space with height, width and depth. For an object, it is the actual position it occupies in space, and this space form is called

visual space. The space form we talk about in the plane composition is planar, hallucinatory and contradictory in terms of human vision. The sense of space in plane composition is only an illusion, and three-dimensional space is an illusion of two-dimensional space, which is still planar in essence.

The first step is to set up the homework about plane space composition, namely using various technique of expression that can create spatial effects to organize the picture and integrate other organizational forms, such as repetition, gradual change, emission, contrast and texture, requiring the designed picture to have the sense of space, sense of rhythm and sense of beauty. The precondition of space composition homework is that students shall not work for the homework only but shall consider whether their design can be transformed into a piece of stereoscopic work of the same effect.

The second step is to make a stereoscopic composition work that is basically consistent with the space composition work in form. In addition, the stereoscopic composition work shall comply with the elements of stereoscopic elements, such as volume, three dimensions, space around, hierarchy. Here consistency of form refers to the form of the work in a certain angle is the same as that in the plane in the same angle.

The third step is to make a color composition completely consistent with the space composition in the organizational relationship. Color composition in this homework involves four major parts of knowledge, namely shade shift practice, lightness shift practice, purity shift practice and hue practice. Shift practice requires models arranged according to a certain pattern, and simple shift practice is likely to lead to excessive simpleness of pictures, so students tend to ignore the form due to color in practice. In the assignment of space composition homework, the requirements of using gradual change, repetition, emission and other regular modeling forms can lay a foundation for the color shift practice. Space composition requires the picture is rich and in line with the regularity, which can not only meet the training of color composition but also avoid the problem of simple picture.

## V. ADVANTAGES OF THE MULTI-DIMENSIONAL SPACE TRANSITION TRAINING METHOD

### A. Strengthening the Relationship Among the Knowledge of the Three Types of Composition

In the teaching of the three major types of composition, plane composition is the first among the three, which is because its knowledge points fully cover stereoscopic composition and color composition. That is to say, color composition covers not only all the knowledge points of plane composition, but also hue, lightness and purity shift, hue and color psychology; stereoscopic composition covers not only all the knowledge points of plane composition, but also volume, space, materials, technology etc. The method of multi-dimensional space transition takes plane composition as the core of topic training and expands step by step around the plane, so that students can transit from plane to stereoscopic space naturally and understand the internal relationship between them. Through this method, students can experience the whole process of designing a finished product in advance,

from conception to sketch, from plane effect to stereoscopic product.

### B. Promoting Students' Positive Thinking

Multi-dimensional space transition training requires rigorous logical thinking. In making two-dimensional works, students should not only meet the homework requirements, but also consider whether the plane works can successfully be transformed into stereoscopic works and whether the three-dimensional works are feasible. The condition for successful transition from two-dimension to three-dimension is that students shall consider the context and difficulty of each line and modeling in designing two-dimensional works. In the design process, students shall also consider whether the transited form of stereoscopic composition is beautiful and whether it can be produced and achieve the expected effect. In the design, students have to consider many factors, which imperceptibly enhance their ability of initiative thinking, so they become more active and concentrated in their homework.

### C. Promoting and Enriching the Types of Homework

If students skip conception and planning before designing an assignment and only follow the requirements to complete the task, their works are likely to be superficial or simple. According to the task setting of multi-dimensional space transition training, there is a certain degree of difficulty set for students at the early stage of their production of works. Therefore, without conception and planning, they cannot start the whole set of homework. In this way, students are encouraged to ponder over the details of the assignment, internal organizational relations and cohesion relations repeatedly, and it is easy to bring students to the state of active research, so the works they made will reflect the sense of profundity and richness.

## VI. CONCLUSION

The course Form Composition is an important part of the basic teaching of art design, and it has been nearly thirty years since its introduction to the basic education of Chinese art design. In the process of educational practice, the course shows its unique charm and profound influence. However, with the development of art and design education reform in China, the course of form composition is to be reformed inevitably. This paper makes a bold attempt to reform the teaching method and seizes the pointcut of the connection between plane composition and stereoscopic composition to successfully realize the transition from two-dimension and three-dimension composition practice based on the method of multi-dimensional space transition training. This not only develops students' design thinking and excavates their creative potential, but also successfully links the three major parts of knowledge, so that students can truly understand the internal relations of the three major types of composition.

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