

Curriculum Construction of “Aesthetic Education Plus” in Universities under the Background of Interdisciplinary Integration: A Case Study of the “Basics of 3D Design” Course

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Abstract:

With the rapid development of modern educational philosophies and digital technology, interdisciplinary integration has become a significant trend in higher education. In this context, this case study explores the construction and implementation of “Aesthetic Education Plus” curricula in universities. It delves into the importance and feasibility of integrating aesthetic education with foundational courses in 3D design, aiming to promote an organic amalgamation of the two to enhance students’ holistic competencies and innovative capabilities. The blending of aesthetic education with foundational 3D design courses not only enriches students’ learning experiences but also effectively boosts their innovative thinking and teamwork skills through interdisciplinary communication and collaboration. Moreover, incorporating new technologies such as virtual reality, augmented reality, and 3D printing technologies offers new possibilities for the pedagogy and practice of “Aesthetic Education Plus” curricula, facilitating students’ exploration and learning of these applications, and advancing the propagation and application of interdisciplinary educational models in universities.

Keywords:

Three-Dimensional Design Basis, Aesthetic Education, Creative Design

1. Introduction

The advancement of aesthetic education in universities is closely linked to national policy directions, and the extent to which it is emphasized is largely influenced by national policies related to aesthetic education. As aesthetic education at universities gradually becomes a central focus of research, the volume of scholarly literature in this field has witnessed explosive growth. This literature covers various dimensions of university aesthetic education, enabling comprehensive, multi-angle, and multi-level

discussions. Although there remains a focus on specific contents and perspectives, the current status, strategies, and implementation of aesthetic education in higher institutions continue to be important research topics. Notably, there is a significant emphasis on the practical aspects of aesthetic education in universities and a stress on the integration of aesthetic education with interdisciplinary studies.

2. Aesthetic Education Aesthetics

2.1. National policies provide substantial support.

The educational authorities in China have further reinforced the important role of aesthetic education within the national educational policies, providing institutional guarantees for its long-term development. Aesthetic education in universities needs to pay closer attention to orientation, basing itself on the transmission of artistic knowledge and skills, and integrating aesthetic education to cultivate socialist values among students. This helps students establish correct worldviews, values, and life perspectives. Through aesthetic education, students can better understand socialist core values, integrate more effectively into society, and become citizens with good moral character and a sense of social responsibility.

The release of a series of policies and guideline documents has undoubtedly laid a solid foundation for the development of aesthetic education in China, providing clear guidance and support for the integration of aesthetic education and curriculum construction. At the same time, it offers valuable experience and reference for the future development of aesthetic education in Chinese higher education institutions, providing important policy support and theoretical basis for the continuous development and innovation of aesthetic education in China.

2.2. Construction of Aesthetic Perception in Aesthetic Education

In the context of integrating aesthetic education with foundational courses in 3D design, the cultivation of students' aesthetic sensibilities becomes an indispensable element. The development of aesthetic perspectives not only serves as a core objective of aesthetic education but also constitutes a cornerstone of design education. By mastering basic knowledge in aesthetic education, students are introduced to fundamental aesthetic concepts such as color theory, the aesthetics of shapes and lines, and the selection of textures and materials. This foundational knowledge provides theoretical support for students to create aesthetically appealing works in three-dimensional design. In practical teaching sessions of three-dimensional design courses, students have the opportunity to apply aesthetic knowledge to real design projects. Through hands-on experience, students gain a deeper understanding and appreciation of aesthetic principles, thereby cultivating and enhancing their aesthetic sensibilities. By participating in various design projects and practices, students can gradually explore and develop their unique aesthetic styles.

Additionally, by engaging in analysis and evaluation of their own and their peers' design works, students are able to continually refine and enrich their aesthetic sensibilities. Three-dimensional design offers students a multidimensional, multiperspective visual exploration experience.

3. Cultivation of Creative Expression and Practical Operational Skills

The integration of aesthetic education and three-dimensional design can stimulate students' creative thinking. Aesthetic education courses provide students with an initiation into creative thought, while foundational courses in three-dimensional design offer a platform for the realization of creativity and the enhancement of expressive abilities. Through the process of exploring different design solutions and addressing design challenges, students' aesthetic sensibilities and creative thinking are refined and elevated.

3.1. Cultivation of Creative Expression

Aesthetic education serves as a crucial conduit for students to comprehend the fundamentals of art and design elements, providing them opportunities to explore basic design elements such as color, shape, lines, and space. By endeavoring to observe, understand, and apply these materials and elements from the perspective of three-dimensional designers, students cultivate a distinctive sense of aesthetics and design. In foundational three-dimensional design courses, students are afforded the opportunity to translate their creative thinking into concrete design proposals. This process typically begins with understanding the requirements of the design task, followed by using sketches to express preliminary design concepts. As students become acquainted and proficient with three-dimensional design software and tools, they start to transform their sketches into more refined and complex three-dimensional models. Figure 1 and Figure 2 showcase students utilizing basic modeling knowledge to construct a three-dimensional pagoda structure. As the course progresses, students not only learn how to use professional tools to express and present their design ideas but also enhance their three-dimensional design skills through continuous experimentation and refinement.

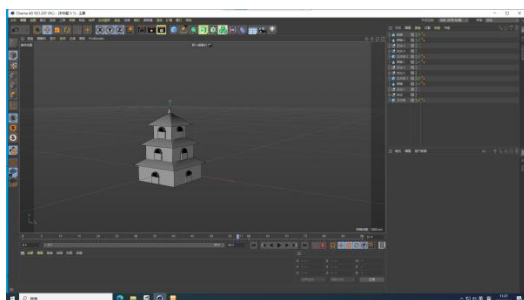


Figure 1. Student In-class Assignment (1).

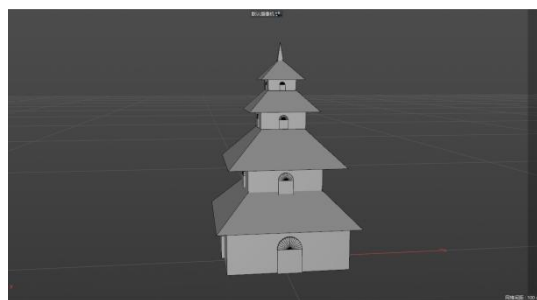


Figure 2. Student In-class Assignment (2).

3.2. Development of Practical Operational Skills

The core objective of foundational three-dimensional design courses is to transform theoretical knowledge into practical operational skills, typically involving substantial hands-on experience. Students are assigned specific design tasks, affording them the opportunity to learn and acquire the workflows and techniques of three-dimensional design through actual implementation. The design process is laden with challenges and uncertainties, and students frequently encounter a variety of technical and design-related issues. For example, they may face challenges in software manipulation or discrepancies between the design outcomes and their expected results. Confronted with these challenges, students must learn to identify effective solutions, a process

that not only bolsters their problem-solving capabilities but also enhances their adaptability.

In practical applications, mastering the use of three-dimensional design software and tools forms the fundamental knowledge imparted by instructors. However, what is crucially more significant is that students learn how to apply aesthetic principles in real-world design scenarios. Design is not merely a display of technical prowess, but rather a harmonious integration of aesthetics and technology. Students need to learn how to adhere to aesthetic principles while utilizing the technical capabilities of three-dimensional design to actualize their design concepts. Finding a balance between technology and aesthetics not only makes the designs visually more appealing but also helps students comprehend the significance and interaction of aesthetics and technology in design. The iterative trials and revisions within practical operations not only enhance students' understanding of the challenges inherent in design but also cultivate their patience and meticulousness. Moreover, this process trains them to maintain an active exploratory and learning attitude in the face of difficulties and setbacks, thereby laying a solid foundation for their future studies in design and professional development.

4. Construction of Aesthetic Education Plus Three-Dimensional Design Fundamentals Course

The integration of aesthetic education with the fundamentals of three-dimensional design effectively opens a gateway for students to the merging of artistic theories. Through this merger, students are able to establish connections between knowledge and skills across different disciplines, which not only broadens their intellectual horizons but also enriches their learning experiences. Figure 3 presents the structural diagram of this chapter, elucidating the role of aesthetic education knowledge, three-dimensional design techniques, expansion of knowledge horizons, and cultivation of innovative thinking in the construction of the Aesthetic Education Plus Three-Dimensional Design Fundamentals course.

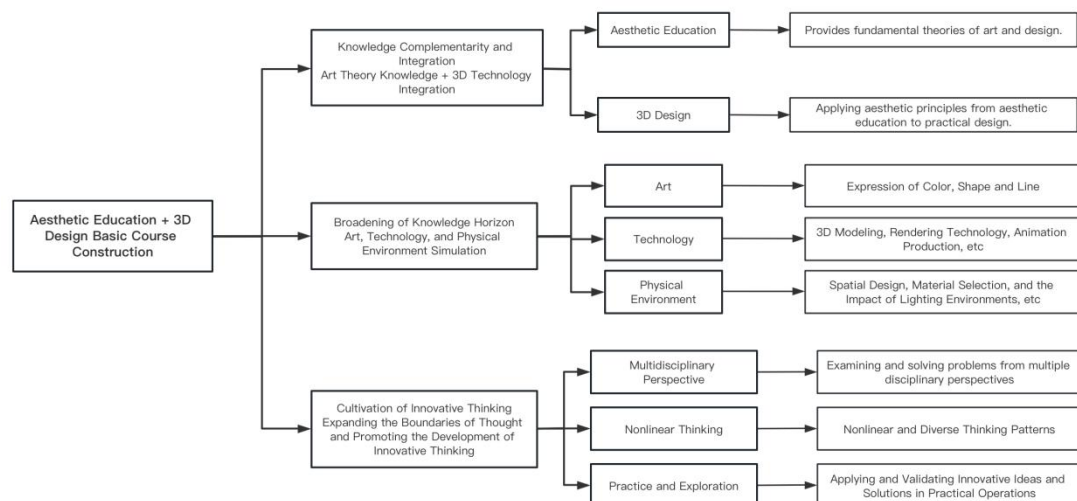


Figure 3. Framework Diagram for the Construction of Aesthetic Education Plus Three-Dimensional Design Fundamentals Course.

4.1. Complementary Integration of Knowledge

Aesthetic education courses and basic 3D design courses are two important components of design education, providing students with fundamental theories of art and design, as well as basic knowledge of design techniques, respectively. The integration of aesthetic education and 3D design courses offers students a foundational understanding of art and design. These two courses approach design education from different perspectives, constructing a comprehensive and solid knowledge system for students. In the initial phase of the course, the basic part of 3D knowledge will cover different effects, genres and main 3D design concepts of 3D design, so that students can understand the development and changes of design at the macro level, laying a theoretical foundation for their design learning. The 3D design modeling stage provides students with basic knowledge of design techniques, and students can learn core design techniques such as 3D modeling, rendering technology, animation production, etc.

By learning these techniques, students can master the basic operations and processes of 3D design, providing technical support for their subsequent design practice. The art and design knowledge in aesthetic education courses provides theoretical support for basic 3D design courses, while the practical operations in basic 3D design courses provide practical application scenarios for the art and design knowledge in aesthetic education courses. For example, they can try to express the shape and spatial relationship in aesthetics through different 3D modeling techniques; realize color matching and expression in color theory through rendering technology; through this integration of aesthetics and technology, students can deeply understand and experience aesthetic education in practical operation, and also be able to play their creative and technical abilities in practical design.

4.2. Broadening of Knowledge Horizon

Interdisciplinary learning, as an important component of modern education, provides students with a broad academic platform, enabling them to understand and explore design issues from multiple dimensions (such as art, technology, physical environment simulation, etc.). This multi-dimensional cognitive model can not only broaden students' knowledge horizons, but also provide them with a comprehensive and diversified learning experience. Within the artistic dimension, students can learn the design through aesthetic education courses, students can learn the basic theories of art and design through aesthetic education courses, understand the aesthetic expression of basic elements such as color, shape, and line, providing artistic support for their design thinking; from a technical perspective, basic 3D design courses provide students with fundamental knowledge of design techniques, enabling them to master technologies such as 3D modeling, rendering, and animation production, offering technical support for their design practice; in the dimension of physical environment simulation, students can explore the relationship between design and the physical environment, such as spatial design, material selection, and the impact of lighting environments, providing practical application scenarios for their design thinking. Interdisciplinary learning offers students opportunities to explore new knowledge across different courses.

4.3. Cultivation of Innovative Thinking

Interdisciplinary learning is a learning model advocated by modern education, which can help students broaden their thinking boundaries and promote the

development of innovative thinking. When students face problems, interdisciplinary learning encourages them to start from different disciplinary perspectives to find possible solutions. Through interdisciplinary learning, students can examine and solve problems from multiple disciplinary perspectives.

For example, when facing a design problem, they can not only start from the perspective of design, but also combine knowledge from other disciplines such as aesthetics, engineering, computer science, etc., to find more comprehensive and innovative solutions. A multidisciplinary perspective often provides students with new solutions and ways of thinking. They can try to combine theories and techniques from different disciplines to explore new solutions, thereby cultivating and enhancing their innovative thinking abilities.



Figure 4. *Student Practical Assignment (1).*



Figure 5. *Student Practical Assignment (2).*

Aesthetic education has given design a profound theoretical foundation, and the emerging design technology has opened up new possibilities for the realization of aesthetic education. Students will try to combine art theory with innovative design techniques, and explore how they can be vividly presented in actual design, thus giving birth to unique and innovative design solutions. Figure 4 and Figure 5 are the students' practical assignments—3D scene construction, where students need to combine traditional Chinese architectural aesthetics with the technology they have mastered to construct scenes. This stimulates diverse thinking patterns among students, encouraging them to break conventional thinking patterns and examine issues from multiple perspectives and levels.

4.4. Explore the application of new technologies

In modern education, the rapid development of technology has brought many new possibilities to the field of design. By incorporating modern 3D design software and technology, students are able to explore the application of new technologies in the realms of aesthetics and design. 3D printing technology offers a convenient approach to the rapid fabrication of physical models. Students can quickly transform their designs from digital models into physical prototypes using 3D printing, allowing them to validate and showcase their design solutions in a tangible environment. VR and AR technologies provide new forms of presentation and interaction for 3D design. Students can try to use VR and AR technologies to elevate designs from a two-dimensional plane to a three-dimensional virtual space, offering users an immersive visual and sensory experience. For instance, through VR and AR technologies, designers and audiences can preview and experience the effects of 3D design by combining real-world spaces with virtual modeling, thereby achieving a more immersive learning effect.

5. Conclusions

In the modern educational system, the integration of interdisciplinary convergence has become an important force in promoting academic and technological progress. Through the integration of aesthetic education and basic courses in 3D design, students can establish connections between aesthetics and design technology, broadening their knowledge horizons and learning experiences. This interdisciplinary learning model has found an organic integration point between theory and technology for students, enabling them to better combine aesthetic education knowledge with practical technology in design practice, thereby creating design works with aesthetic value. Diverse communication and cooperation also provide a favorable environment for students' innovative thinking, enabling them to view and solve problems from different perspectives and dimensions, thereby cultivating their innovative thinking abilities. Interdisciplinary learning fosters students' continuous learning and self-renewal capabilities, allowing them to continuously explore and learn in their future academic and professional careers, adapting to constantly changing and updating knowledge and technical requirements.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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