

Analysis on the Cultivation of Creative Thinking in the Teaching of Production and Education and Product Design

Xiaoxiao Cao^{1,2}, Xiaoyang Hu¹, Han Yongxue²

¹Communication University of Zhejiang, Hangzhou, Zhejiang, 310019, China

²Zhejiang Gongshang University, Hangzhou College of Commerce, Hangzhou, Zhejiang, 310012, China

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Abstract: The practical activity of product design has high requirements for talents' innovative consciousness and creative ability. In the process of product design teaching, teachers should pay attention to cultivating students' creative thinking, and set a more specific training model based on this. In this process, modern design methods should be introduced to stimulate students' creative potential. In addition, there are many product design majors currently seeking a training model of school-enterprise cooperation. In this process, the integration of industry and education has become a new teaching concept, which does not solve the key points and difficulties in teaching and helps students form creative thinking. Based on this, this article will discuss the two aspects of the integration of production and education, product design teaching, how to cultivate students' creative thinking, and put forward specific strategies.

1. Introduction

In order to meet the society's demand for design talents, teachers must make teaching adjustments, adopt multiple teaching models, and lead students to build a complete knowledge system. In this process, whether it is the reform of the curriculum or the reform of teaching methods, it is carried out around the cultivation of students' creative thinking. Therefore, the integration of production and education and product design teaching should also keep pace with the times, looking for more ways to cultivate students' creative thinking.

2. Integration of Industry and Education

The integration of industry and education means that in the process of professional education, it will cooperate with relevant industries to jointly cultivate talents to achieve the purpose of talent training. The integration of industry and education can provide students with more workplaces and art practice venues. On this basis, they can cultivate talents who understand both art and creation.

Because the course is the most basic basis in the process of teaching activities, it can help schools better achieve the goal of talent education. In the course of product design teaching, not only the reform of teaching, but also the reform of the curriculum to adjust the curriculum structure. Therefore, on this basis, it is necessary to seek a curriculum for the integration of industry and education, and to reform new methods in order to cultivate students' creative thinking.

3. Creative Thinking

Creative thinking refers to that people put forward more creative opinions on the basis of thinking and understanding, including the innovation of innovative thinking modes of thinking content and so on. Creative thinking has the characteristics of flexibility and novelty.

The process of product design is a process of creative thinking activities. In the process of cultivating students' creative thinking, students are required to continue to explore and summarize experience. Only in this way can students try to put forward more views on the basis of summing up the characteristics of product design. More meaningful opinions.

Taking the design of a cup as an example, when people mention the cup, they will form a

specific shape in their minds. Designers will also be affected by certain forms during the design process and may not be able to escape this limitation. So most designers may design similar products. If the designer has creative thinking, it is possible to jump out of this boundary and design the cup in a new way. The designer of this process only considers the action of people drinking water, and considers how to achieve the purpose of drinking water, on this basis, different forms of cups can be involved. For example, filterable, extruded, etc.

Current product design has become a creative industry that can measure the economic strength of a region and a country. In product design teaching, teachers should focus on cultivating students' creative thinking and innovative thinking, so that students can become creative talents.

4. Enhance Students' Creative Thinking in the Integration of Industry and Education

4.1 Clarify Professional Development Goals and Characteristics

Considering the demand for talents in the design industry, most colleges and universities adhere to the general talent direction when training design talents. Due to insufficient understanding of the industry background, it is impossible to set a clearer professional training direction. In recent years, companies have been constantly refining the division of labor among designers. Taking into account the actual needs of the industry, colleges and universities should cultivate talents with strong aesthetic ability, strong product expression and creative ability.

4.2 School-Enterprise Cooperation

In the process of integration of industry and education, colleges and universities have sought a new way of school-enterprise cooperation, can share resources, and jointly cultivate students through project cooperation. Schools should consider their own situations and the situation of enterprises to set up cooperation models. The main purpose is to enable students to transform their knowledge and achievements into practical skills and enhance students' creative thinking.

On this basis, the school can introduce enterprise projects or solicit project plans from participating enterprises, and on this basis, complete the teaching content according to the requirements of the enterprise. This process can give full play to students' creative advantages, so as to provide companies with more creative product design solutions. In this process, the enterprise must formulate design tasks and design standards to provide students with a place to make models. In this process, the enterprise uses the creativity of the students, and the students improve their professional abilities in the process of enterprise practice.

For example, in 2016, Shenzhen Huitang Lighting Factory established a cooperative relationship with universities and introduced traditional iron flower lighting design projects, and the product design teachers and students who cooperated with it provided more than ten sets of excellent design solutions. The company made these design plans into samples and produced two sets for product sales. Students compare the drawings and samples they made, and find that there is still a difference between actual creation and actual production. In this process, students applied more creative methods, and product design also gained a deeper understanding of pattern design. I also have a deeper understanding of the structural design process design and other aspects that may be ignored.

In order to enhance students' creative thinking and train students' practical ability. In the teaching process, teachers should also encourage students to participate in various product design competitions, and participate in the collection of design proposals of major enterprises. For example, various home appliance companies such as Haier and Hisense, as well as various furniture companies such as Qumei and Carpenter Tan, solicit designs from the society every year. Schools can encourage students to participate in design competitions, in order to improve students' creative ability and develop students' creative thinking.

4.3 Establish a Production-Education Integration Base

On the basis of using school-enterprise cooperation, product design major should also strengthen the construction of the major itself, highlight the characteristics of the major and increase external

exchanges. In universities, a base for the integration of production and education can be established. For example, some colleges and universities have introduced more teaching activities based on the Northeast Regional Decorative Culture Research Center, focusing on the study of the Northeast local culture, including the application of Northeast straw weaving in product design, the development of Northeast characteristic tourist souvenirs, etc. These are new practical teaching activities. In this process, students are encouraged to provide more design solutions for enterprises, and students are encouraged to actively participate in social creative collection. [1]

These methods can make students' theoretical knowledge structure more perfect, and improve design skills in the process of practice. This process can also be more deeply integrated into the product design industry, solve practical problems that arise, and continuously improve creative capabilities.

5. Cultivation of Creative Thinking in Product Teaching Design

5.1 Training Principles

In the course of teaching, teachers should follow a number of principles, on this basis to cultivate students' creative thinking. The first is to delay evaluation. When students put forward creative ideas or specific ideas, they cannot immediately judge right or wrong. Students should be given enough room to think, allowing students to continually develop their thinking, collect opinions from multiple parties, and integrate them. Afterwards, teachers and students discussed the development of more specific standards.

The second is exploration. Product design is a process of finding and solving problems. If the teacher directly tells the students how to solve the problem, the creative thinking of the students cannot be improved. This process requires students to find problems themselves and find solutions to them.

Third, open. Whether it is classroom activities or teaching practice activities, teachers should help students break the shackles of traditional thinking and reverse the bad thinking stereotypes. Teachers can adopt a variety of training methods in this process, such as bionic simulation brainstorming and so on. These methods can expand students' thinking space, and allow students to put forward more unique opinions. This process also creates an environment for fostering creative thinking.

Fourth, personalized democracy. Teachers should focus on cultivating the personality of students, students have unique expression methods and design forms. It is not possible to design a unified standard and unified answer for students. It is necessary to consider students' own characteristics to establish more targeted training programs. In this process, we must adhere to the principle of democracy, encourage students to express their inner thoughts, and interact well with students. [2]

5.2 Cultivate the Fluency of Thinking

The creative thinking process of students is based on further analysis and processing on the basis of ideas, and finally some valuable thinking can be obtained. This process requires students to have smooth and innovative thinking. When designing products, it is necessary to have a large number of ideas in a short period of time before we can generate more and more valuable creative thinking.

On this basis, teachers can adopt brainstorming training methods. The teacher first determines a suitable design object for the students. General requirements and standards designed for students. Students should be able to come up with as many design plans as possible in a short period of time. This process does not require the quality of the students' design. The main purpose is to open up the students' ideas and allow them to come up with more design solutions in a short time, so that the students' thinking will be more fluent. [3]

On the basis of students' concentrated thinking and proposing design plans, teachers can let students screen themselves, or perfect their own design plans. In the end, the more satisfactory works are selected and can be explained to everyone. Tell everyone, where is the innovation of this product? It is evaluated by other teachers and students. This process allows students to feel how

creative thinking is generated and how to achieve it.

5.3 Cultivate the Flexibility of Thinking

There is no unified standard for product design and no unique answer. As long as it can highlight product functions and reflect product characteristics, they are all excellent works. In the process of product design, only students with creative thinking can design different products with unique characteristics. So in order to avoid the same situation of product design, teachers should cultivate students' flexibility of thinking. When students are facing the same design task, they can introduce more innovative ideas based on different conditions and traditional ideas. This process can omnidirectionally and flexibly observe and solve problems.

For example, Japanese product design master Fukasawa, the designed products are more practical, give full play to practical functions, and the appearance is more rustic. This is because he did not blindly follow the trend when designing, according to his own ideas, but he paid more attention to the appearance and more to the essence of the design. Therefore, teachers should let students learn to be flexible and observe problems from multiple angles.

5.4 Cultivate Originality of Thinking

Originality is a kind of thinking ability that is different from others. The designed scheme has its own value and is also different from other schemes. In fact, innovation is hierarchical, with shallow, deep, local, and overall. Teachers should cultivate the originality of students' thinking, so that students have a deeper and more comprehensive innovation. This requires teachers to create a unique teaching environment to encourage students to question and criticize. You can use reverse thinking in design. For example, the scissors designed by Japanese product designers are different from the traditional scissors. There is no need to extend your fingers into it. The appearance of the entire scissors is more like a disc. Through the spring winding, the user can operate from different angles. It is originality.

5.5 Cultivate the Integration of Thinking

Teachers can adopt two different teaching methods to cultivate the integration of students' thinking. First, teachers encourage students to think in all directions and allow students to initially summarize their thinking. On the basis of the summary, the thinking is diverged again, and then summarized again. This divergence has to go through many times in the process of summary. This process can effectively improve students' thinking integration ability. Second, let students first have a perceptual knowledge of things, then rise to rationality, and finally test it in practice. In this way, students can discover the connection and difference between rational thinking and perceptual thinking, and make reasonable use of different forms of thinking. For example, when designing an office chair, teachers should first let students think about the different ways of movement in life, and let students summarize and interpret the different ways of movement and discover the principle of reaction. On this basis, we will continue to try different sports and compare the advantages and disadvantages. In the end, the best way to move can be drawn, and a more complete solution can be proposed.

6. Conclusion

Teachers should break the traditional teaching model, break the students' thinking pattern, and develop students' creative thinking in the process of practice and teaching. In this way, students will pay more attention to the original intention of the product and the essence in the design process, and they can always adhere to a creative thinking attitude and design more satisfactory products.

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References

- [1] Yin Yangjian. Exploration of project-based teaching reform of art design courses in universities from the perspective of industry-education integration--Taking commercial display design courses as an example. *Art Education Research*, no. 7, pp. 113-116, 2019.
- [2] Hou Fengxian. Research on the cultivation method of college fashion design talents under the interaction of art and technology. China Academy of Art, 2016.
- [3] Wu Di. Practice and research on the talent training model of “dual training, arts and crafts integration” of art design majors in colleges and universities. *Software (electronic version)*, no. 6, pp. 153-154, 2015.