

PAPER • OPEN ACCESS

Study on the Ecological Education of Product Design

To cite this article: Kunpeng Li *et al* 2019 *IOP Conf. Ser.: Mater. Sci. Eng.* **573** 012029

View the [article online](#) for updates and enhancements.

You may also like

- [Analysis of the Creativity Development and Assessment of Architectural Design Education: A Case Study of Basic Design Studio](#)
Beyza Sat Gungor and Derya Yorgancioglu
- [Application of Computer Aided Design Teaching in Ceramic Product Design Education](#)
Xuan Xie
- [Research on Innovation of Art Design Education Mode in Colleges and Universities Based on Computer Aided Technology](#)
Jiefang Jin



ECS
The
Electrochemical
Society
Advancing solid state &
electrochemical science & technology

DISCOVER
how sustainability
intersects with
electrochemistry & solid
state science research

Study on the Ecological Education of Product Design

Kunpeng Li^{1*}, Kaining Meng², Yuli Zhong³

¹School of Art and Design, Xihua University, Chengdu, Sichuan, 610039, China

²School of Art and Design, Xihua University, Chengdu, Sichuan, 610039, China

³School of Art and Design, Xihua University, Chengdu, Sichuan, 610039, China

*Corresponding author's e-mail: 524977881@qq.com

Abstract: At present, although the design of our country has made progress to a certain extent, in the process of its gradual development, there is still a waste of resources and the pseudo-ecological design emerges one after another. Therefore, this paper mainly analyses the problems existing in design education, and puts forward a new concept of design education based on the view of ecological education, and makes a useful supplement to deepen the concept of ecological design. Let students grasp the relationship between design and humanity, design and ecology, design and society, design and ethics comprehensively. On this basis, try hard to explore the teaching model which is beneficial to the development of product design education in our country, promote the development of product design education in our country to a greater extent, and cultivate innovative talents of ecological consciousness.

1.Introduction

The world uses nearly 260 million tons of plastics whole year, of which 170 million tons are disposable, and only about 14% of the plastic packages are recycled and most of the waste plastics are discarded or landfill. In a study published in the journal Royal Society Open Science, an open access journal founded by the Royal Society on Feb. 27, 2018, researchers found plastic fibers in six deep-sea trenches and nine sites along the Pacific coast. At least 72% of the digestive system contained plastic fibers and particles, and 84% of the lamellae found micro-plastic fibers. The startling data also suggest that there may be no more marine ecosystems in the world that are not affected by plastic pollution. The ocean contains at least 5.25 trillion pieces of plastic, weighing 268940 tons, and these plastic debris returns to humans in various forms. Now, scientists have found plastic particles in people's feces. If we only concerned with the immediate interests, it will hurt human beings finally. Only when the concept of ecological is deep-rooted in people's mind, the ecological environment can be effectively improved.

Therefore, design education should not only pay attention to the combination of theory and practice, but also train responsible designers, carry out ecological education, put more emphasis on the relationship between design and humanities, design and ecology, design and ethics, design and society. Only in this way can we really promote the progress of design in our country.

2.Current situation of domestic product design education

Theoretical knowledge education is the place where design education needs to be perfected. Design practice should be based on abundant theories. Theory plays a guiding role in practice. Only by mastering the theoretical knowledge firmly can student carry on the design practice better. Let students



carry on the design practice because of the curriculum project blindly, will only let them carry on the imitation continuously, but cannot really grasp the design innovation consciousness. Students can only design the product, and do not take the social value and economic value of the product into account. Such a design is irresponsible. It is the lack of theoretical guidance of ecological education that leads to the emergence of more and more pseudo-ecological products in the market.

Responsible design was first proposed by the American design theorist *Victor Papanek*. One of his most important books "*Design for the real world*" offers a new perspective on the purposiveness of design, namely, design should seriously consider the use of the earth's limited resources, and design should serve to protect the limited resources of the earth we live on.

3. About ecological education and ecological design

Ecological education is mainly to realize the need of sustainable development and to create ecological civilization society, and to integrate the relevant ideas, principles and methods of ecology into the process of modern education. Carrying out ecological education is the fundamental way to improve the public's ecological consciousness and shape ecological civilization. It can provide spiritual resources for solving the contemporary ecological crisis and realizing sustainable development. As shown in table 1, the performer, educational content and expected results of ecological education are shown.

Table.1 The framework of ecological education

| | Performer | Educational Contents | Expected Results |
|-----------------------------|----------------------|---|------------------------------|
| Ecological Education | Government | Ecological Theory Ecological Knowledge | |
| | Enterprise | Ecological Technology Ecological Culture | Ecological view of nature |
| | School | Ecological Health | Ecological world view |
| | | Ecological Security | Ecological ethics |
| | Home | Ecological Value | Ecological values |
| | | Ecological Philosophy | Sustainable development |
| | Publicity Department | Ecological Ethics | Ecological civilization view |
| | Mass Organizations | Ecological Identification | |
| | | Ecological Aesthetics | |
| | | Ecological Civilization | |

In the field of product design, the most intuitive embodiment of ecological education is ecological design. Ecological design requires priority to be given to ecosystem attributes throughout the product life cycle. In other words, it is a harmonious and unified whole system of human-environment-product, rather than a narrow focus on people's own interests and needs. It makes design follow nature and serve ecology, and emphasizes the harmony and unity among the whole system composed of people, nature, environment and products.

The new industrial revolution has pushed the world into a new and complex design era, and the world today will undoubtedly make greater progress than in the past. However, we cannot fail to see that the world today is also full of more contradictions and crises than before, such as the increase in population, the energy crisis, the serious destruction of the natural environment and ecological balance and so on, all of which threaten human beings all the time.

It is imperative to promote ecological design in China. Ecological design is not only a technical consideration, but also a conceptual change. And the application of ecological design in product design requires designers to give up the excessive emphasis on the appearance of products and focus on the innovation in the real sense.

4. Discussion on the New idea of the Development of Ecological Education in Product Design

This paper uses the concept of ecological education to discuss the educational development of product design, as shown in figure 1, mainly studies and analyzes the relationship between design and humanity, design and ecology, design and society, society and ethics, and on this basis, constructs the framework of product design ecological education.

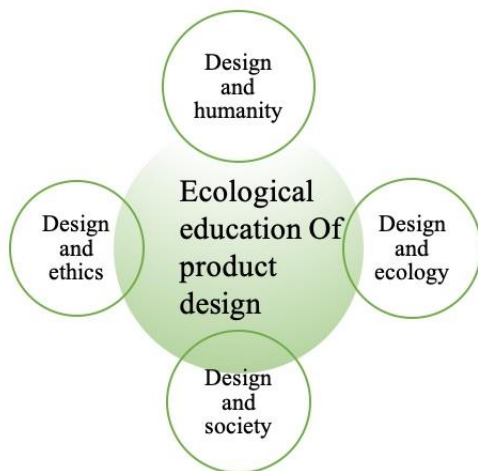


Figure.1 The framework of product design ecological education



Figure.2 Chanel womenswear

4.1. Design and humanity

As far as product design is concerned, the humanistic view of design is carried out around each link of people, product, environment and society. The cultural background, environment and concept of people and society constitute the humanistic view of product design. And in terms of design education, designers trained by universities and colleges should pay more attention to social hot issues and take safeguarding the long-term interests of the society as the fundamental starting point of design activities, instead of only competing for immediate interests.

Nowadays, the society tends to be pluralistic, and the main contradiction of our country has been transformed into the contradiction between the increasing needs of the people for a better life and the unbalanced and inadequate development. And diversified design is also needed to meet the increasing spiritual needs of the people. In the field of clothing, as shown in figure 2, Chanel initiated the revolution of women's clothing liberation and prevailed in the world, liberating the clothing styles that bound women's bodies and enabling women to obtain psychological and physiological freedom. Good design not only makes consumers satisfied from the function, but also makes consumers enjoy the meaning of design and maximize humanistic care.

4.2. Design and ecology

The progress of science and technology and the development of human civilization are accompanied by a series of problems such as the exhaustion of resources and environmental pollution. And the harm brought by the destruction of the environment is gradually approaching the daily life of human beings. In the past, product design led to a great deal of waste of natural resources in the process of pursuing commercial interests. Therefore, design should be used as means to solve ecological problems and guide people to pay attention to ecological problems.

Ecological design is not only a new strategy to protect the environment, but also the need of developing circular economy. As shown in figure 3, the plastic can be used as road paving tiles by crushing it and then processing it into different shapes, reducing plastic pollution as well as recycling.



Figure.3 Floor tiles made of plastic

4.3. Design and society

Social design models take into account factors related to all human beings, including physiological, cognitive, psychological, social and cultural factors. It can be said that everyone is a designer, because design is the most basic activity of human beings. In order to survive, human beings will always make various instruments to solve problems in life. Reviewing the development history of design, the design forms in different stages are based on and serve the society.

Siemens hearing aid is a typical example, convenient and easy to carry, according to the physiological structure of the ear. Soft materials are selected and the color is close to the skin. Moreover, after receiving the external sound source, it can be transmitted to the ear more clearly.

4.4. Design and ethics

The ethics of design develops and progresses from the coordination between human and nature and the social environment. On the ethical level of design, there are three following aspects: first, it refers to the relationship between design and natural. For example, "green design", "ecological design" and "sustainable design" are advocated, with the emphasis on the status of natural environment. Second, it refers to the ethical boundary in the design. Third, the relationship between design ethics and the establishment of social order. Design ethics raises concerns about special groups of people who are physically disabled. Now design ethics are increasingly reflected in product design, such as the braille library. Good design takes the ethical value as the guidance, carries on the moral ethics norm to the design activity personnel all the time, creates good social atmosphere.

5. Conclusion

Design should be sustainable and design education should foster responsible designers. And attention should be paid to the cultivation of design theory: social view of design, social ecological view, humanistic view of design, ethical view of design. Designers need to study how to make the products more in line with the sustainable development of human beings and the needs of human survival. It is necessary not only to minimize the environmental load and resource consumption of products throughout their life cycle, but also to meet the requirements of improving the quality of life. Therefore, it is necessary to put the thought of ecological education into the product design education, and develop innovative design talents with ecological thinking.

References

- [1] Papanek, V. (2013) Design for the Real World. M. CITIC, China
- [2] He, R.K. (2000) History of Industrial Design. M. Beijing Institute of Technology press, China
- [3] Tao, H.Y. (2013) A study on the modernity of Chinese design from the perspective of sociology. D. Chinese National Academy of Arts, China
- [4] Wang, Z., He, W. C., Wang, T. M., (2006) Ecological design -- design for the sustainable development of society .J., Journal of Beijing University of Aeronautics and Astronautics, 2006(03):28-31+36.
- [5] Tian, Q. H., (2018) Industrial design innovation and industrial design education development .J.,

Estate and Science Tribune, 17(08):140-141.

- [6] Tian, H.(2018) To interpret the existence and development of design art from the Angle of sociology .J., Art education, 2016(08):281-282
- [7] Zhi, Y.(2018) The new value of design in the context of consumer society .J., Art and Design, 2(Z1):26-28.
- [8] Xiong, X.F., Zhao, Y.Y.,(2018) Analysis of public service facilities based on design ethics .J., Packaging Engineering, 39(06):240-244.