



A Feasibility Study on the Transformation and Sustainable Development of “Disposable Tableware” in Taiwan Night Market

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Abstract. Taiwan’s night markets have a long history and are well-known overseas. Visiting a night market is one of the essential trips for foreign tourists who come to Taiwan. For short-stay travelers, the night market gives them a variety of typical Taiwanese cuisine experiences in a short period of time and the feeling of Taiwanese culture full of warm hospitality. For locals, the night market is an important part of daily life. Besides enjoying food inside the shops, many people prefer to eat while walking, or take food back home. As a result, a lot of lunch boxes and utensils are used and unfortunately, much of this cutlery such as disposable chopsticks, foam bowls, and other disposable table-ware is difficult to degrade and not environmentally friendly. Nowadays, there are more than 400-night markets in Taiwan and it is easy to imagine how much garbage will be produced even if only a quarter of these are open every day. If we fail to handle this waste problem properly, the environment will bear a heavy burden. This study will trace the history of Taiwan’s night markets, look for potential cultural factors, and analyze the impact of consumer behavior and eating habits on the design of tableware. It is expected to establish a sustainable development system to reduce and gradually eliminate “Disposable Tableware” in the future. Based on this, we will further enhance the night market experience of both Taiwanese people and tourists and explore the connotation of night market culture with the core of “Eating-together”, “Sharing” and “Interaction”. Through Value-added culture, it is possible to convert such new tableware into a special “cultural product” that becomes a potential derivative of the night market culture.

Keywords: Taiwan night market culture · Disposable tableware · Sustainable development · Reducing plastic · Low-carbon

1 Introduction

Typical Taiwanese snacks are found everywhere, but Taiwan’s night markets, in particular, are the places where these snacks can be found in abundance. Trying out these snacks, tourists will be able to learn about different specialties, cultures, and

people from different areas, adding a whole new perspective to traveling since each night market has its own traditions and characteristics. Shilin Night Market is the largest and one of the most famous night markets in Northern Taiwan, located in capital city of Taipei. The daytime Shilin Market was formally established in this area in 1909, and the market was inaugurated in 1913; now it is famous for its various eateries selling authentic Taiwanese snacks. In Taiwan, the best nightlife is found in food markets and these magnificent markets add rich flavors to Taiwan’s nightlife. The country has a penchant for snacking and there is a strong desire amongst the people to eat with friends all night long. For overseas visitor swishing to get a real Taiwanese experience, skipping the convenience stores and heading out on the town for a night market snacking excursion is essential. In recent years, many of the night markets have become popular tourist destinations among sightseeing foreign travelers. In addition to food, night markets feature various forms of entertainment and a lot of shopping. Across their centuries-old history, the “Memory” and “Technique” in the Taiwan night markets have become special cultural factors.

At present, when people go to the night market to taste the food, consumption is roughly divided into two modes: “inside use” (which means eat in the store) and “outside” (meaning to take away the food and eat while walking). The first case will tend to reduce the use of unfriendly tableware by use of reusable tableware but some stores will also provide disposable tableware to allay any concerns that the tableware provided by the store may be unsanitary. However, the author believes that those disposable tableware may be even more unsanitary.

When people choose to take away their food, the store can only provide “disposable tableware” to consumers: disposable chopsticks, cartons, paper bowls, plastic bags, etc. Many people also like to eat while walking through the night market and at the entrances and exits of the night market, managers usually place several large trash cans which may or may not be segregated for recycling. We can’t help but ask, after the end of the night market business, are there any staff to sort the garbage in the trash can? If there is, then you need to give them applause. But I am afraid the actual situation is no. In this way, the seriousness of the problem is even more dramatic. However, when people enjoy food, do they realize that the tableware used is not environmentally friendly? In addition, some tableware such as foam bowls give off many substances that are detrimental to the body when burned (Figs. 1 and 2).

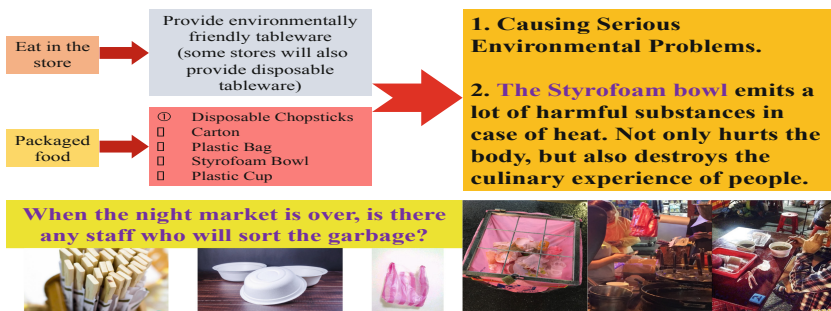


Fig. 1. The cost behind the deliciousness - Serious environmental problems



Fig. 2. Garbage brings fatal danger to other creatures

2 Literature Review

2.1 Green Design

In recent years, as people’s awareness of environmental protection has increased, people’s attention to and review of environmental issues have been repeatedly mentioned. Stephen P. Bayley, the former director of the Design Museum, said: “Green Design is a foolish idea, something created for and by journalists [1].” However, no matter what people think about “green design,” environmental problems have become more serious. Environmentally Sustainable design (also called environmentally conscious design, eco design etc.) is the philosophy of designing physical objects, the built environment, and services to comply with the principles of ecological sustainability [7].

Food, shelter, and clothing: that is the way we have always described mankind’s basic needs. With increasing sophistication we have added tools and machines to our list because they enable us to produce the other three items. But man has more basic needs than food, shelter, and clothing. We have taken clean air and pure water for granted for the first ten million years or so, but now this picture has changed drastically. While the reasons for our poisoned air and polluted streams and lakes are fairly complex, industrial designers and industry in general are certainly co-responsible with others for this appalling state of affairs. The designer-planner shares responsibility for nearly all of our products and tools and hence nearly all of our environmental mistakes. He is responsible either through bad design or by default: by having thrown away his responsible creative abilities, by “not getting involved,” or by “muddling through.” Three diagrams will explain the lack of social engagement in design. If we equate the triangle with a design problem, we readily see that industry and its designers are concerned only with the tiny top portion, without addressing themselves to real needs [9, pp. 56–57] (Fig. 3).

Biodegradable materials (i.e., plastics that become absorbed into the soil, water runoff, or air) will have to be used more and more in the future. The Tetra-Pak Company in Sweden, responsible for the distribution of seven billion milk, cream, and

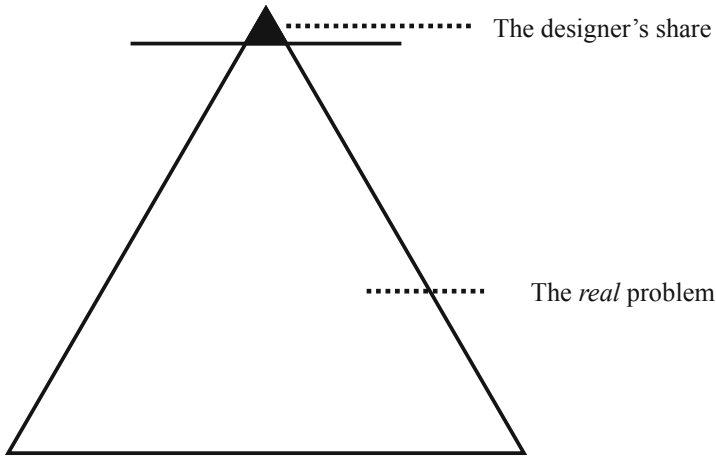


Fig. 3. The design problem [8]

other packages a year, is now working on an ideal self—destructing package. A new process, developed in 1970 in collaboration with the Institute for Polymer Technology in Stockholm, accelerates the decomposition rate of polyethylene plastics. Thus, packages decompose much more rapidly after they have been discarded without affecting their strength and other properties while still in use. A new disposable, self-destructive beer bottle called Rigello has been on the market since 1977. Many more than just these few early Swedish solutions will need to be introduced to save us from product pollution [9, p. 95].

Ecology and the environmental equilibrium are the basic underpinnings of all life on earth; there can be neither human life nor human culture without it. Design is concerned with the development of products, tools, machines, artefacts and other devices, and this activity has a profound and direct influence on ecology. The design response must be positive and unifying. Design must be the bridge between human needs, culture and ecology. This can be clearly demonstrated. The creation and manufacture of any product—both during its period of active use and its existence afterwards—fall into at least six separate cycles, each of which has the potential for ecological harm [10].

2.2 Emotional Design

The relationship between products and people is equally important too. Norman argued that the solution is human-centered design (HCD), an approach that puts human needs, capabilities, and behavior first, then designs to accommodate those. Human-centered design is a design philosophy which starts with a good understanding of people and the needs that the design is intended to meet. This understanding comes about primarily through observation, for people themselves are often unaware of their true needs, even unaware of the difficulties they are encountering. Defining the specification of the product is one of the most difficult parts of the design, so much so that the HCD

principle is to avoid specifying the problem as long as possible but instead to iterate repeated approximations. This is done through rapid tests of ideas, and after each test modifying the approach and the problem definition. The results can be products that truly meet the needs of people [8].

Suri argued that as designers, most of our work is about making things, not for ourselves or people we know, but for other people. These other people have different experiences; they live in other places, have other ideas and habits, other abilities and concerns, other expectations and preferences. How can we learn about what other people need and what they will enjoy? How can we know about what they currently do and how their experiences might be enhanced by things we design for them? We also need to be Looking at What People Really Do. Suri continued that it is much easier to get excited about designing for people once we know them and understand their situation. One of the classic ways to do this is to become familiar with a few key individuals and contexts through observation [3].

2.3 Culture Creative

In today's competitive market, "Innovation" serves as a competitive advantage allowing companies to dominate particular market segments. With respect to corporate design strategy, innovation is not only the key to expanding market share, but also the key to increasing commercial gains [2]. With the transformation and shifting of the industrial structure, the current goals are "improving value" through design, adding value to industry through cultural creativity, and enhancing the "added value" of products [6].

The purpose of design is to improve the quality of life of human beings and to enhance the cultural level of society. Designers must master the pulse of social culture as a design reference and reflect on design. Future designs must return to the perspective of humanistic aesthetics. Technology is only a technical aid and cannot be used to dominate design. The future design is the integration of art, culture and science to solve social problems and reposition human life forms. In particular, the digital technology world of the 21st century is based on "humanity" and the design of "culture" is more important, the so-called cultural creative design. This paper aims to explore how to convert "culture" into "creative" and value-added products "design": that is, how "cultural creativity" is "value-added design" [5].

3 Research Methods

Visiting night markets, observing the behavior patterns of consumers, recording the tableware needed for different foods, and finding areas where the environmental friendliness can be improved. At the same time, understanding how other countries deal with similar problems and tapping into the parts that can be used for reference. Finally, studying existing policies and regulations as a basis for further design and exploration (Fig. 4).

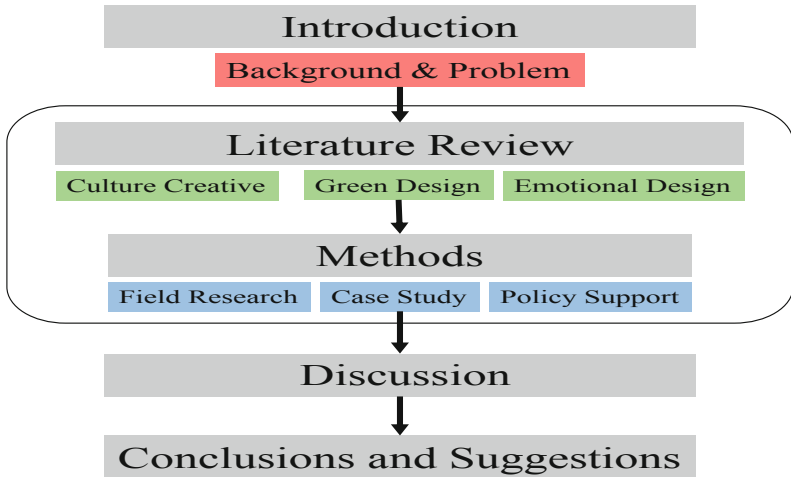


Fig. 4. Research process

3.1 Field Research

Taiwan has more than 400-night markets. The author uses Taiwan’s leisure time to study and visit several night markets, such as NingXia Night Market, Nanjichang Night Market, Raohe St. Night Market, Huaxi St. Tourist Night Market, Yansan Night Market, Nanya Night Market, Taitung Tourism Night Market, Keelung Temple Night Market, HuaYuan Night Market, Dadong Night Market and so on.

Through the visit, typical night market foods and tableware used for take away food was collected. It is not difficult to see that this tableware is not friendly to the environment. Some even poses certain dangers, such as bamboo sticks. In addition, some stores offer disposable tableware to consumers while also providing environmentally-friendly tableware (Figs. 5 and 6).

Night Market Dishes	Disposable Tableware to be used
Coffin Board	Paper Bag, and Disposable Chopsticks
Ta-a Noodles	Carton, and Disposable Chopsticks
Oyster Omelette or Vermicelli	Styrofoam or Paper Bowl, and Disposable Chopsticks
Minced Pork Rice	Styrofoam or Paper Bowl, and Disposable Chopsticks
Bubble Tea	Plastic Cup and Straw
Stinky Tofu	Paper Bag, and Bamboo Stick
Taiwanese Meatball or Sausages	Paper Bag, and Bamboo Stick
Green Onion Pancake	Paper Bag, and Plastic Bag
Shaved Ice	Carton, and Plastic Spoon
Taiwanese Spring Roll	Plastic wrap and Bag
Popcorn Chicken	Paper Bag, and Bamboo Stick

Fig. 5. Some typical night market foods and tableware used

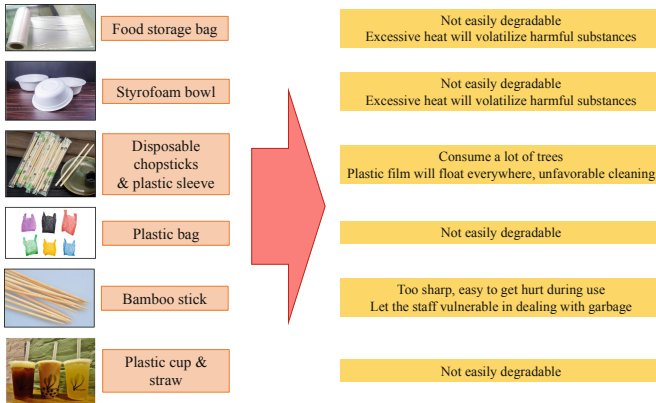


Fig. 6. Disposable tableware and its harmful to the environment and people

3.2 Case Study: Some Attempts in Taiwan, Korea, and India

Taiwan. In recent years, with the improvement of national environmental awareness, many night markets in Taiwan have also reduced the harm caused by disposable tableware through some simple measures.

In order to encourage people to bring their own tableware, some night markets have set up special areas with cleaning supplies for the public to clean their tableware. There are also some night markets which offer large dishwashers for the convenience of the store. Of course, if we start to improve from source, it is better. For example, some stores have begun piloting the elimination of disposable tableware. At the same time, they post notices in eye-catching places to tell people that the tableware provided has been disinfected and can be used with confidence. In addition, more and more people will bring their own tableware. However, for foreign tourists, it may be a little difficult to bring their own utensils. They depend on the store to provide environmentally friendly tableware.

An Uruguayan mixed-race girl, nicknamed Goldfish Brain uploaded a 4 min video on YouTube to promote her environmental philosophy. She said: “I feel that environmental protection is a satisfied attitude. I don’t take extra things, like plastic bags or cups, but make good use of my existing items.” When she goes out, she will carry eco-friendly cups, environmentally-friendly cutlery sets and folding bowls. In addition, she will carry a variety of environmentally friendly straws, including bamboo straws, glass straws, and stainless steel, so that she can introduce them to different stores. Most Taiwanese people and foreign tourists do not bring their own environmentally friendly tableware. She, on the other hand, will prepare a green bag for her mother to carry food purchases home. Initially, her mother forgot it every time, and continued to bring home plastic bags from the market. However, as time passed, her mother was also fell into the habit, reducing the use of plastic bags (Fig. 7).

Korea. Tong Market (통인시장) in Seoul, South Korea, is a traditional market and located near to the Royal Palace and the MRT station. As a result, it is visited by many



Fig. 7. Some improvement measures in Taiwan night market

foreign tourists. The market consists of about 75 storefronts, with restaurants and stalls selling mostly food, as well as fresh produce, clothes and daily goods. In order to revitalize the traditional market, market managers have come up with a great idea.

Visitors can exchange Korean won for traditional copper coins and then play at the market. The market also provides a lunch box (unfortunately not environmentally friendly) and, visitors can take the copper coins to different stores, following the prompts to buy different foods (approximately 2–3 coins can buy a food). Visitors can choose to eat while walking, or return to the tourist service center in the middle of the market Where a dining area and reusable cutlery are provided. In my view, this idea of a lunch box for everyone is worth learning as this will at least reduce the amount of such tableware used. However, some foods such as seafood soups and other liquid foods may require a bowl (Fig. 8).



Fig. 8. A method worth learning from Tong Market, Seoul, Korea

India. The same situation exists in India too. India currently has a total population of about 1.31 billion people and is also the country that uses the most disposable tableware in the world. On average, 120 billion disposable tableware are discarded every year. The environmental pollution caused by garbage has become one of the major social problems in India.

Indian inventor Narayan Peesapaty aimed to reduce the amount of plastic tableware discarded after single use and which polluted the environment. In 2010, he founded Bakey's in Hyderabad, Central India, using various natural ingredients such as millet, rice, and flour to make edible spoons and chopsticks which can be eaten after the meal is finished. Bakey's tableware can be stored for three years before use and contains no preservatives so after use, it will decompose on its own in about 4 or 5 days if not eaten. This set of edible tableware not only does not pollute the environment, but the price is also very affordable for ordinary people. The interesting part is that this spoon doesn't get soggy even in hot food and water and remains edible for up to 3 years. Narayan said in an interview with the Deccan Chronicle: "I know that my main competitor is a cheap plastic spoon. My spoon is 2 rupees each (about NT\$ 1), but I am trying to lower the price to 1.5 rupees, or even 1 Rupee. If demand increases, prices will fall even more. I'm looking forward to replacing plastic tableware with our products in small restaurants and railway restaurants in the future."

This is currently the most desirable way to find other alternatives. For me, why not take such a fun tableware home? This is also a focus of future research in this study. A tableware with a strong Taiwanese culture, would encourage every visitor interested in Taiwan to bring it back to their home country, allowing the tableware to sublimate into a gift and cultural product (Fig. 9).



Fig. 9. Edible tableware invention by Naran Peesapaty, India

3.3 Policy Support

Environmental issues are not limited to impassioned “slogans”, nor can they rely entirely on people’s “consciousness.” In this study, the promotion of “environmental tableware” will undoubtedly bring about a lot of behavioral changes but whether the cost of such tableware should be borne by the store or the consumer is worth further discussion and it may be necessary to have a policy at the national level. At present, many countries including Taiwan have formulated corresponding policies and regulations - for example, many countries no longer offer plastic bags for free, which encourages people to use reusable bags, including those made of environmentally friendly materials (such as tote bags).

Only policy support can avoid many problems in the process of implementation. An example worth studying is the Environmental Protection Administration of ROC promotion of a 2 years project in Hsiao Liouciou Island named “Plastic-free, Low-carbon Island Demonstration Project”. The project consists of five components. (1) Reduce plastic & forced waste sorting from source. (2) Resource recovery & reduction of waste. (3) Properly treat sewage & improve air quality. (4) Landscaping and high-quality drinking water. (5) Eco-friendly hotel & reduction of carbon emissions and waste. The scope of this project is very large, and some of these measures are clearly able to provide a lot of input to this study.

4 Discussion

This study traces the history of Taiwan’s night markets, looks for potential cultural factors, and analyzes the impact of consumer behavior and eating habits on tableware design. It is expected that a sustainable development system will be established in the future to reduce and gradually eliminate “disposable tableware”. Through this system, it is expected to further enhance the night market experience of the public and tourists, with Eating-together, Sharing, and Interaction as the entry point. Design to experience the special cultural connotations of Taiwan’s night market. In turn, through the appreciation of culture, this tableware has transformed into a special cultural product, which has become a potential derivative of the night market culture.

Through observation, people are actually aware of the problems in the tableware currently used, and they also understand that they have already placed a burden on the environment. The authors found that more and more people are carrying their own tableware to night markets. Some stores will also call for the government to introduce measures, such as the appropriate reduction of the use of plastic bags.

Although the style of Eastern and Western cuisines is different in the way of dining, I think it is possible to learn from the Western buffet diet. The environmentally friendly tableware should be a group consisting of a bowl and a pair of chopsticks. But if you just replace the bowl and chopsticks with environmentally friendly materials, it does not seem to be the ultimate goal of this study. In this way, the cost of this set of tableware will eventually be passed on to the consumer (even if the store bears the cost of tableware, it will increase the price of the food).

In the future, the following three points should be at the core of the concept and design of this set of equipment: Eating-together, Sharing, and Interaction.

Eating-together. Chinese & Taiwanese cuisine is different from Western food, and everyone likes to sit and enjoy it together. Generally, people will go to the night markets together since people like to share food. Because the night market food sometimes comes in large portions, the advantage is that you can eat a variety of foods without consuming enough of any one to make yourself full.

Sharing. For foreigners, the Taiwan night market is usually recommended by the Internet and friends. The word of mouth between friends allows food experiences to spread. This is the spirit of sharing. In addition, in the process of tasting food and sharing experiences amongst friends, mutual emotions and friendships increase.

Interaction. Visiting the night market is a process of fully experiencing Taiwan’s local culture. In the night market, there are not only a variety of foods, but also many other activities to experience, such as some traditional games. For people, whether it is tasting food or gaming experience, it is an interactive experience. In this study, the design of tableware also needs to consider the details of the interaction process, such as that the tableware should be stable, and even have a temporary cover to protect it from the elements and contamination (Fig. 10).

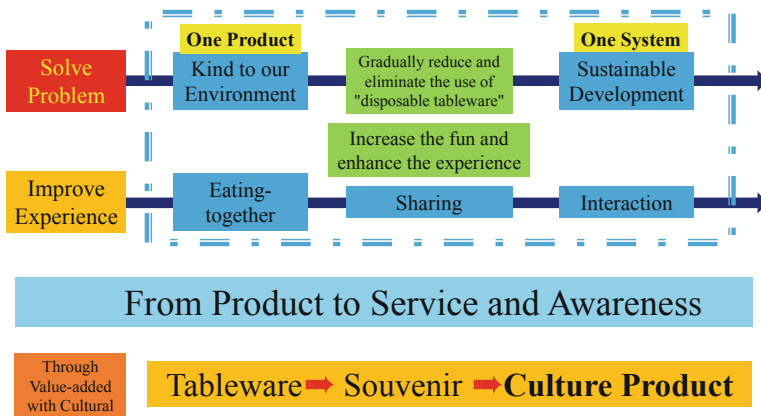


Fig. 10. Research purposes and future conception

5 Conclusions and Suggestions

This study is still in progress and no model of a product has yet been proposed. According to the previous research and discussion, I expect to find some potential entry points and be able to translate these into the basic concepts of design in the future. At this stage, it is obviously impossible to completely eliminate the use of disposable tableware as the store and consumers are not fully prepared.

Taiwan is a multi-cultural society with a variety of inputs from Southern China, significant East Asian influences including Japanese and such Western influences as American, Spanish and Dutch. Over time, Taiwan gradually developed its own distinctive culture [4] and the night market is a representative of the Taiwanese lifestyle. The tableware of the future should also have strong Taiwanese cultural elements. In this way, through the cultural value-addition, this tableware becomes a gift and eventually a cultural commodity. Whether it is for locals or foreigners, I hope that this product is not only a traditional tableware but also a cultural product. Whenever you see it, you can feel the culture and characteristics of Taiwan.

At the policy level, the government has also formulated many regulations and policies. In the author's opinion, it may be possible to promote these in certain areas first and receive timely feedback from consumers and industry. This may be more secure than laying it out without any experimentation.

Finally, it is important to experience the culture of Taiwan in the process of enjoying the food but more importantly, to be kind to our environment and protect the planet we live on.

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References

1. Bayley, S.: On green design. *Design*, 52 p. (1991)
2. Hsu, C., Chang, S., Lin, R.: A design strategy for turning local culture into global market products. *Int. J. Affect. Eng.* **12**(2), 275–283 (2013)
3. Koskinen, I., Battarbee, K., Mattelmäki, T.: *Empathic Design: User Experience in Product Design*, pp. 52–54. IT Press, Helsinki (2003)
4. Lin, R.: Transforming Taiwan aboriginal cultural features into modern product design: a case study of a cross-cultural product design model. *Int. J. Des.* **1**, 45–53 (2007)
5. Lin, R.: Cultural creativity added design value. *Art Apprec.* **2**, 1–9 (2005)
6. Lin, R., Lin, P.H.: A study of integrating culture and aesthetics to promote cultural and creative industries. *J. Natl. Taiwan College Arts* **5**(2), 81–106 (2009)
7. McLennan, J.: *The Philosophy of Sustainable Design*. Ecotone, Kansas City (2004)
8. Norman, D.A.: *The Design of Everyday Things*, pp. 8–9. Basic Books, New York (2013)
9. Papanek, V.: *Design for the Real World: Human Ecology and Social Change*. Thames & Hudson, London (1984)
10. Papanek, V.: *The Green Imperative: Natural Design for the Real World*, p. 29. Thames & Hudson, London (1995)