Chinese Cultural Features for New Product Design Development

A Thesis Submitted for the Degree of Doctor of Philosophy

by

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Abstract

Cultural and creative industries are a growing and profitable sector in the UK. The industry blends historical culture with modern creative design to promote one's culture and to make profits. A cultural feature is the main characteristic of a cultural product; however most of the current cultural products are printed or decorated in a way that lacks an emotional or meaningful cultural link with consumers. Emotional engagement is the key factor when people make their decisions. Therefore, a design toolkit was created to assist designers to enhance an emotional connection between consumers and products. The research approaches involved a literature review to classify categories of cultural features, a questionnaire to measure emotional responses to Chinese cultural products, expert interviews to develop the toolkit, and workshops to validate the toolkit. This research is the first study to highlight emotional aspect of cultural products in order to enrich user experience. The contributions of the research are investigating human emotions of cultural products and developing a novel toolkit to support designers when creating cultural products.

Keywords: cultural product, cultural sensitivity, emotional design, aesthetic, user experience

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MOTIVATION BEHIND THE RESEARCH

Because of globalization and mass production, products of the same function tend to be very similar and standardized. Among all products with the same functions in the global market, products which get more attention and are more desirable for their consumers can bring more profits to the companies. However, many cultures and traditional skills are diminishing due to industrialization. Therefore, an awareness of protecting and supporting local culture has emerged. This has stimulated a new trend of creating products which differentiate themselves by representing the culture and identity.

Cultural and creative industries have driven industrial innovation and development. Particularly, the successful examples in the UK have inspired many countries to invest in these industries. Products inspired from oriental culture are a prosperous business (Huang, 2013), for example, in mainland China, the compound annual growth rate was 20.2% from 2005 to 2009.

In our daily life, emotion plays an important role which helps us with decision making or enhancing memories (Reeves and Nass, 1998; Damasio, 1994). Emotion is created by the personal meaning of the products or interaction with the product (van Gorp and Adams, 2012). Therefore, an emotional connection is triggered by an

individual's memory or built up through the meaning delivered by products' aesthetic appearance and interaction experience.

Products which carry cultural meanings establish an emotional connection with users and are a benefit for expanding and preserving cultural values. Many products in the market, particularly in museum gift shops or tourist gift shops try to make products that serve as a representative of a trip or a memorable visit. However, these products only use images printed on the surface of the items, rather than use cultural imagery in the overall design of the product. It results in these souvenirs being very similar to each other. Without consideration of a meaningful link between the images and the product, the product is unlikely to make an emotional connection with its consumers. Thus, the aim of this thesis is to develop a design toolkit for cultural products which can assist designers to enhance emotional engagements of products and consumers. By increasing the emotional attachments, products can bring more profits for the companies and be more engaging with consumers.

1.1 Problem Statement

Since products in the market are very similar in their function and price, what can draw consumers' attention and make the products differentiate themselves from others? As a result of globalization, while people can find products from chain companies all over the world, concern to find unique products is increasing (Featherstone, 1995).

In modern production, functional and technological features of a product are essential. In order to make products differentiate from other similar ones, some companies and design studios are using symbolic meanings in their product design to achieve a competitive position (Clifton, 2011). Because of this trend, culturally sophisticated products have been preferred over technological products since the 1980s (Sparke, 2004). Ravasi, Rindova and Dalpiaz (2012) also highlighted the

cultural significance of products and further explain innovation activities from technology-based toward culturally-informed. Some studies have shown that experiential perspectives of consumers have been neglected in the past and it has been found that consumers are increasingly buying products for symbolic meaning; these meanings evoke feelings of pleasure and enjoyment as well as fantasies, imagery, and aesthetic demand more than just for practical functions (Ravasi, Rindova and Dalpiaz, 2012; Verganti, 2009; Holbrook and Hirschman, 1982). Besides, consumers choose products which contain cultural meanings to represent their personal identity and social status (Rompay, 2008; Ravasi, Rindova and Dalpiaz, 2012). That is to say, people's purchasing intention is driven by emotional and meaningful connections with the products. Cultural influence can be the link that makes products meaningful and emotionally engage their consumers. Hence, incorporating cultural characteristics into modern product design makes the product distinguish themselves among all standardised products, helps owners express their social identity, and delivers the traditional aesthetic value of a culture. Therefore, cultural features are suggested to be involved in new product development.

The products, which involved cultural features, are mainly superficially copied from the traditional original artwork, such as the example in Figure 1.1. However, there are some products, which were inspired from the traditional cultural features and the features were transformed or integrated into the usage of the product, such as figure 1.2. This research would like to investigate how consumers feel about the products and what they like.

Figure 1.1 A mug decorated with traditional Chinese painting (from National palace museum)

Figure 1.2 A seasoning set designed by Alessi

In addition, to date there is evidence, through the literature review, of only three significant approaches to propose design models and a design procedure for cultural products. These design models illustrated an overview of cultural products and the correlated concepts or current issues as well as provided steps of design process and research methods for developing cultural products.

- "Culture-oriented design model" was based on the culture of Botswana (Moalosi, 2007).
- "Cultural product design model" was developed from the indigenous culture of Taiwan (Lin, 2007).
- "Procedure of observation and design of cultural product experience" was developed from the culture of Taiwan (Teng and Chuang, 2011).

Cultural products are a prosperous business and there are many possibilities waiting to be gleaned from rich cultural resources. Culture-orientated models suggest incorporating cultural features into the product design process; however, there is still a lack of classifications of cultural features, nor a practical design toolkit to assist designers in the initial design process. This study aims to provide the classifications of cultural features as well as a design toolkit for cultural products.

The oriental culture has been a rich and inspirational source for Western designers, artists, and architects, inspiring either attractive art and objects or exotic decorations and materials; this has been due to the exchange and integration of oriental and Western culture under global trade as well as growing economies (Freeman, Evans and Lipton, 1990). In addition, it is a trend in Eastern countries to promote their cultures through products and present the cultural uniqueness in the global market. Due to their inspiration and cultural promotion, this research will consider Chinese culture as an example of a cultural resource for products.

New Product Development

The term 'new' does not have a singular definition within research; the term can be used to mean a variety of different phases within product development. Rogers and Shoemakers (1972) argued that newness is a comparative concept when an individual perceives a product to be new and different from others. Booz, Allen & Hamilton (1982) suggested classifications of new products could be the first of the kind in the market, a new product type or new line for a company, improvement of current products, or reducing the cost or new applications for existing products. In this thesis, the term 'new' will be used in the context of new product development through improving current cultural products by enhancing emotional engagement.

Trott (2012) described the spectrum of design activities in product development as: engineering solutions, product form concepts, and fashion design trends. Trott regarded engineering solutions in terms of product function, the manufacturing process, and cost effectiveness. He went on discuss product form concepts as colours, graphics, packaging, and the ergonomics of products. Finally, he explained fashion design trends as a focus on market style, consumers' expectations, styling, and emotions. Trott used these three activities to illustrate two types of product innovation called Technology Push and Market Pull as shown in Figure 1.3. Technology Push is based on the research and development of functional product forms, creating the products by a suitable manufacturing process, and finally presenting the appearance of the product to users. On the other hand, Market Pull uses these concept in a different order by beginning with fashion design trends of product appearance, then considering the product forms regarding the market style, and then making products by appropriate manufacturing methods.

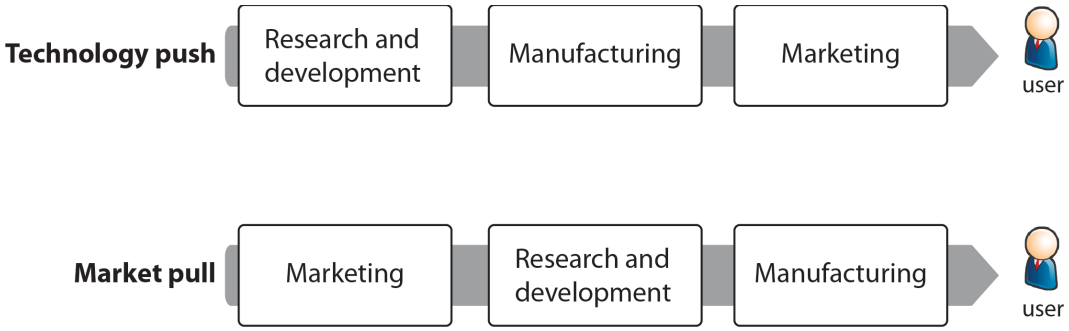

Figure 1.3 Linear models of product innovation (Adapted from Trott, 2012 p.22)

In addition, Verganti (2009) proposed a new model which used Trott's concepts of Market Pull and Technology Push, however, added a design-driven innovation by focusing on the generation of new meanings and users' interpretation within a socio-cultural context (Figure 1.4). The research presented in this thesis is plotted in Verganti's design-driven innovation spectrum, because unlike technology push or market pull, the focus of this thesis is on enhancing emotional connection through adding cultural meanings and values on products.

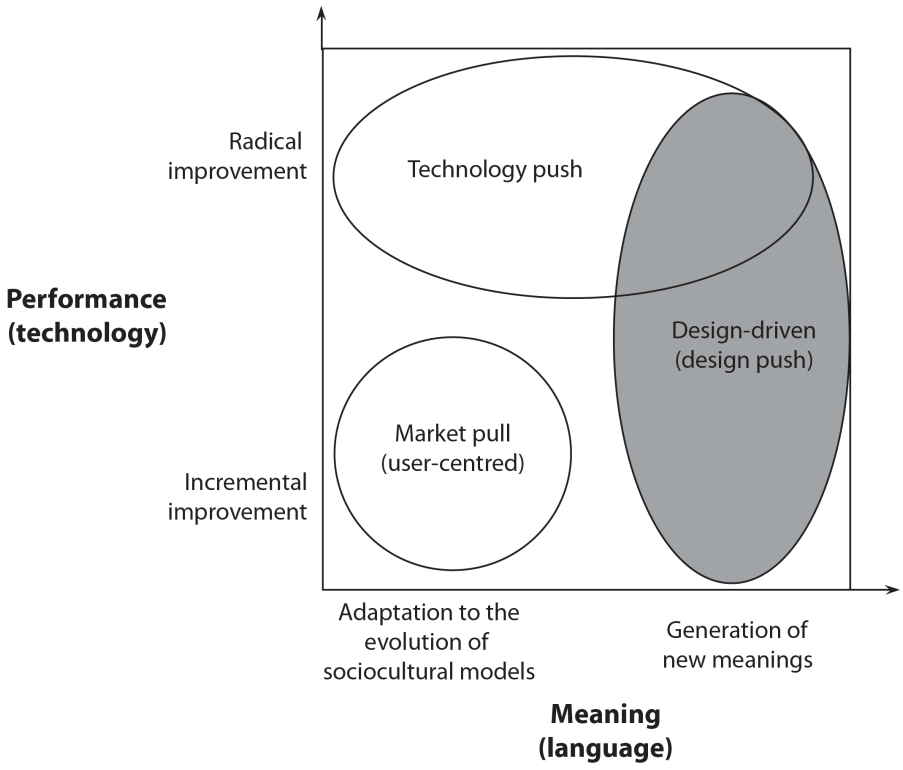

Figure 1.4 Innovation strategies (Adapted from Verganti, 2009)

In summary, in this thesis new product development is discussed as improving the current cultural products. The acknowledgement of a research gap drives the creation of a design toolkit. Additionally, the role of emotion in creative design industries focuses on Chinese cultural features.

1.2 Research Aim, Objectives, and Questions

The overall aim of this research is to develop a design toolkit for Chinese cultural products which can assist designers to enhance emotional connection of consumers to products. On the basis of the aim of the research, the objectives have been identified below:

- To carry out a literature review in relation to: the definitions of culture, currently utilised cultural and design features, influence of emotional design, emotional assessments, and cognitive process in product appraisal
- To measure emotional responses of Chinese cultural products from Eastern and Western participants by a questionnaire
- To develop a design toolkit for Chinese cultural products based on the results of the questionnaire, which will be analysed to determine information that can be important to designers when considering cultural features and a user's emotional engagement with their product

Therefore, research questions corresponding to the objectives are:

1) What are the cultural features that characterise a cultural product?

2) How do Eastern and Western populations emotionally appraise Chinese cultural products?

3) What emotions could be expressed in reaction to certain Chinese cultural features?

4) What information should a cultural product toolkit have for designers?

1.3 Significance of This Study

Designers use the form, appearance, and design of their products to attempt to create a meaningful connection with consumers. A meaningful link between consumers and their products is an important factor in a purchase because it can increase consumers' emotions and desires for the products. Involving cultural features that express a consumer's cultural identity can enhance this meaningful link; this may add value to the product for the consumer as well as increase their emotional attachment when making purchase decisions. An emotional attachment may cause a consumer to retain a cultural product even after it can no longer perform its functional use. Therefore, in this thesis cultural features and the correlated emotional responses are investigated for new product design development.

Products that carry cultural meanings establish an emotional connection with users and are a benefit for expanding and preserving cultural values.

Cultural features are categorised from evolving definitions of culture and classifications of museum collections. Culture includes intangible beliefs and values as well as tangible artefacts or visible symbols. In this thesis, the focus will be on visible cultural symbols or features because they can be used in design practice. Therefore, these categories of visible cultural features are suggested as representatives of oriental culture.

This study is the first to investigate emotional responses of Chinese cultural products from both Eastern and Western populations. This is significant because previous research has developed theoretical models without creating practical applications of the design practice. Furthermore, use of these models did not consider emotional responses corresponding to cultural features in a practical way.

1.4 Contributions to Knowledge

Cultural and creative industries have been a prosperous business. Some studies have approached industrial cultural products through proposing cultural-oriented models and procedures (Moalosi, 2007; Lin, 2007; Teng and Chuang, 2011). However, this research took a slightly different approach in which human perception was taken into account, and a design toolkit was created for designers to enhance emotional connections. The research took a closer look in the models and procedures, and found a gap, that there was lack of understanding of the link between consumers' emotions and cultural products. Therefore, this research aimed to fill the gap and the research outcome was developing a design toolkit which can provide information and assistance to enhance consumers' satisfaction. The toolkit represents a contribution to design practice, while the potential categories of cultural features with their correlated human perception represent a contribution to design research.

Additionally, the potential of the research is to improve cultural sensitivity of designers and to lift up the issue of aesthetic awareness of traditional Chinese culture in modern product development. Highlighting the local cultures in a product becomes an innovative way to differentiate the products from others of mass production. Emphasising the cultural meanings and delivering the aesthetic values of traditional culture on products raise the awareness of protecting local cultures. Designers are therefore important message deliverers and their cultural sensitivities are key to designing a meaningful and valuable product.

1.5 The Structure of the Thesis

Figure 1.5 illustrates a schematic framework of this thesis. Chapter 1 outlines the motivation on the research topic, the problem statement, research aim, objectives and questions as well as significance of this study. Chapter 2 defines the features of a cultural product which involve definitions of culture and of cultural industries as well as recent studies regarding the design process. Chapter 3 describes how humans

process information and how they perceive it. Chapters 2 and 3 provide literature reviews about what cultural products are, how information is processed, and human emotion and cognitive process in product appraisal. Chapter 4 explores general research approaches and design research approaches; these lead to the use of a questionnaire in Chapter 5, the development of the design toolkit in Chapter 6, and finally interviews and workshops to validate the toolkit in Chapter 7.

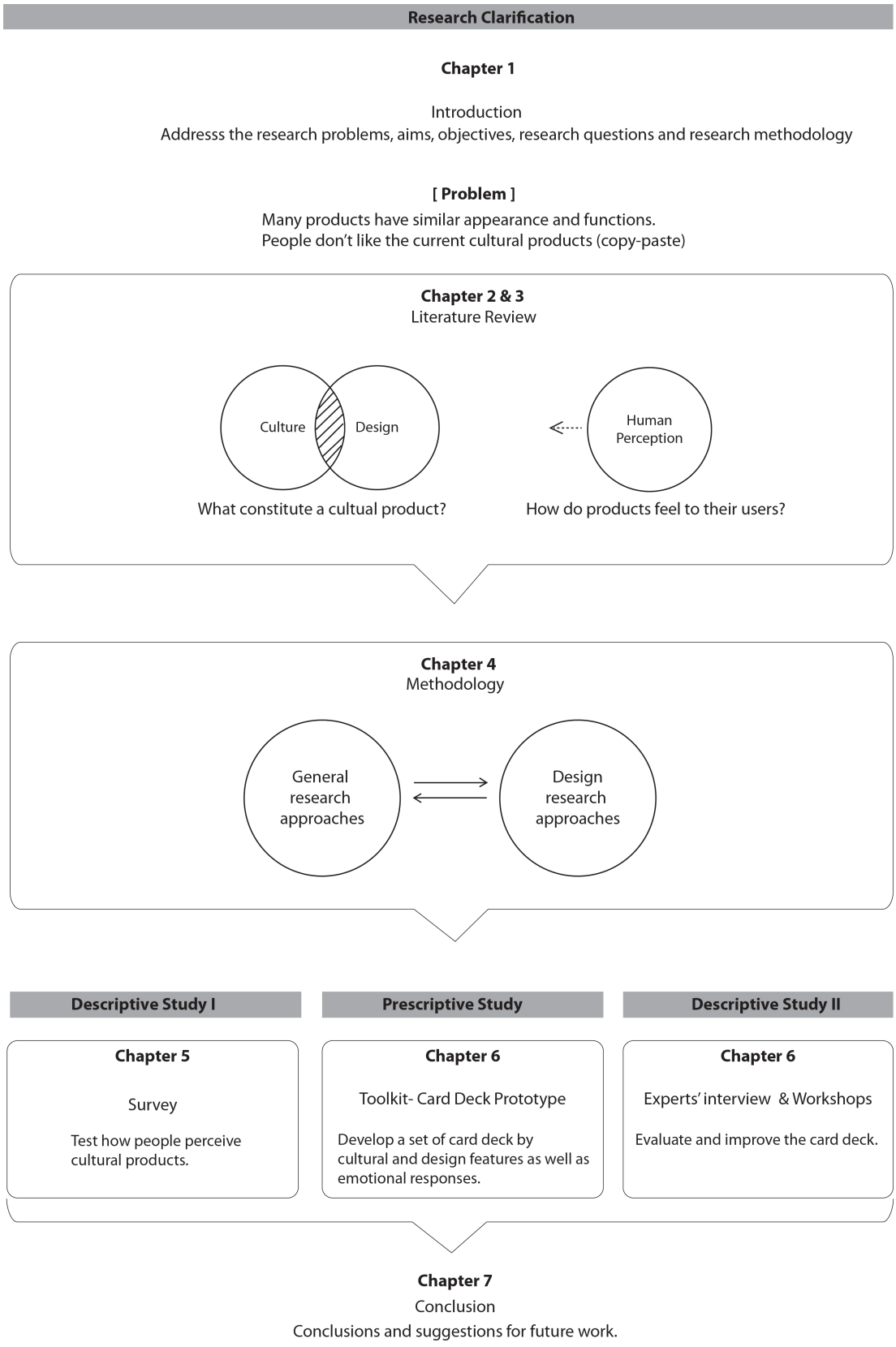

Figure 1.5 A framework of this research

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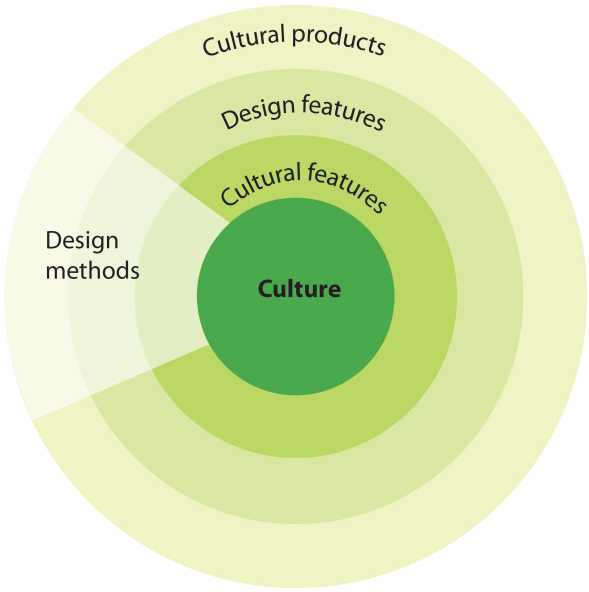
WHAT CONSTITUTES A CULTURAL PRODUCT?



Products which integrated cultural features and design features through design methods can deliver the value of the culture. Cultural symbolic meanings add value to a cultural product. For a better understanding of cultural products, this chapter begins by explaining evolving definitions of culture, cultural & creative industries, as well as with related current research of cultural products. Then, design practice and methods are introduced to show ways of presenting and including cultural features in modern products. Finally, applicable categories of cultural features and design features are suggested.

2.1 Culture as Inspirational Resource

In this section, the definitions of culture as well as how culture can be an inspirational source are described. The examples of integrating culture into modern life are demonstrated by the use of cultural products within cultural and creative industries. Design models which elaborate how cultural features are represented in new product design are addressed.

2.1.1. Evolution of Cultural Definitions

In ancient times, the initial meaning of culture was the activities of raising crops or animals for food with the appreciation of what was given from nature, people showing their respect to God, and thus religion was born (Williams, 1988). Gradually, in the sixteenth century, the definition of culture extended beyond this to include education. The development of human intellect, spirituality, aesthetics, and artistic activities -- including fine art, music, literature, painting, sculpture, and theatre -- were considered to be symbols of civilization during the eighteenth and nineteenth century. Williams (1988 p. 90) further pointed out a definition of culture is *"A general process of intellectual, spiritual, and aesthetic development, a particular way of life, and the works and practices of intellectual and especially artistic activities"*. However, a turning point emerged in the Romantic era which designated culture as different customs and traditions of a group of people within an area (Storey John, 2001; Eagleton, 2000; Gay et al., 1997; Williams, 1988; Kroeber and Kluckhohn, 1952). These authors demonstrate how cultures distinguish themselves through examples such as: folktales, customs, holidays, sports, religious festivals, traditions, and heritage.

Throsby (2001) identified culture as a set of attitudes, beliefs, mores, customs, values and practices of a group of people. He also identified culture as a result of social activities which involve creativity, symbolic meanings, and intellect of a group of people. Hofstede and Jan Hofstede (2005) reported that culture is the way that a social group distinguishes themselves from others. They used the term 'human

mental programming' to describe the relationship between human nature, culture, and personality, as shown in Figure 2.1. In their diagram 'human nature' (the base of triangle) is a common characteristic which is inherited and applies to almost everyone, culture (in the middle of the triangle) is not inherited but learnt from one's social environment and shared common experience with a group of people, and 'personality' (the tip of the triangle) only applies to a particular individual's personality. Culture is shared by a specific group of people and is a learned trait rather than an inherited trait.

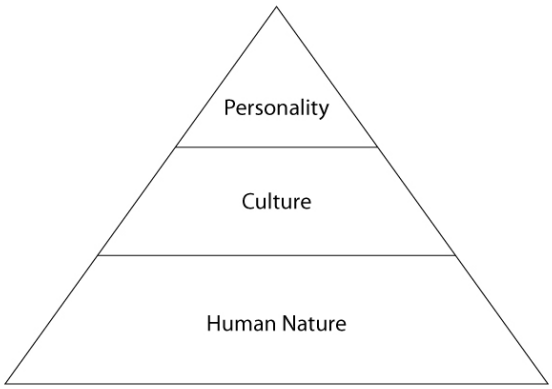


Figure 2.1 Three levels of uniqueness in human mental programming (adapted from Hofstede and Jan Hofstede, 2005)

Furthermore, some research has shown that culture is constituted by artefacts, beliefs and values, underlying assumptions (Schein, 1999) and symbols (Hatch, 1993). Hofstede and Jan Hofstede (2005) further illustrated culture in concentric circles, as shown in Figure 2.2, using the terms 'values', 'rituals', 'heroes', and 'symbol' by the different levels od depth. 'Value' is the core concept in the diagram and is defined as the preference or worth of something over others. Moving outward in the concentric circles, 'ritual' is the term used to describe the social activities of a group of people. The next circle is "hero" which refers to those people who have a huge influence in the society. Finally, the outer-most circle is 'symbol' which describes specific embedded meanings that can be comprehended by those who understand the

culture. In this thesis, we will return to the meaning of value and symbols in later chapters.

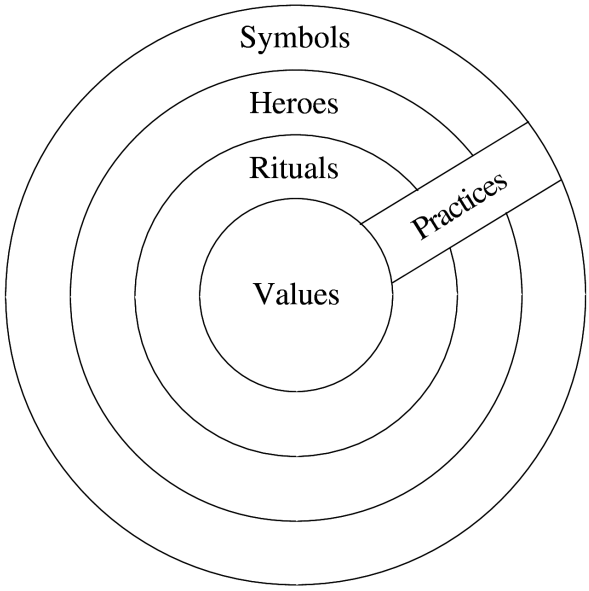


Figure 2.2 The onion model of culture (adapted from Hofstede and Jan Hofstede, 2005)

It is claimed that intangible beliefs and values of a culture are manifested in tangible artefacts and visible symbols; however, it is argued that culture tends to be an abstract concept which is opposite to material, technology, and social structure in the perspective of anthropologists (Smith and Riley, 2009). In other words, culture is the spiritual and non-material development of a society including intellectual or aesthetic progress. In this study, the focus will be on visible presentations of abstract culture in a society, because the visible cultural features are more easily recognised and applied. For instance, art, artefacts, objects, customs, festivals, food, architecture and local nature can be visible representatives of a culture. Thus, cultural features in this research mean the representative elements of culture which can be recognised and easily identified by people outside of the culture. The cultural features can be found in diverse lifestyles, intellectual properties, artistic activities, creative production, and symbolic communications in a group of people.

2.1.2. Cultural and Creative Industries

The commercialisation of culture can be viewed from positive or negative perspectives. Some authors view it as a loss of value, such as philosophers Adorno and Horkheimer in their book Dialectic of Enlightenment (1972); they argued that culture had lost its value because of being commercialised and commoditised in societies. Conversely, Miege (1989) claimed that the interweaving of culture, new technology, and business results in commodification of culture which leads to creation and innovation.

Cultural and creative industries are examples of commercialising culture, and they incorporate culture into art and design to make profits. The economic value of cultural and creative industries in the global market is growing quickly (UNESCO, 2005) and statistic reports by UNESCO as well as Art & Business have shown that cultural and creative industries are profitable. For example, UK creative industries have brought eight million pounds per hour to the UK economy (Javid, 2014). This business outcome results in much private investment increasing and reaching its climax; for example, heritage organizations received the majority (34.4%) of private investment in the cultural sector of the UK, followed by visual arts (Arts and Business, 2013). This result shows consumer's preference for cultural products in the global market.

The term 'cultural and creative industries' is identified as profitable in the global market, however, it is important to clarify which industries and activities are included. As demonstrated in Figure 2.3, Throby (2008) argued that cultural industries are a broader field which includes creative industries at its core. The layers that Throby presented could be interpreted as categories of how strongly arts relate to industries. The core layer includes original art work such as literature, music, and visual arts. The next layer is the places or activities where the core art works are displayed such as museums and galleries. Moving outward, the next layer is the communication of these core art works through media such as television and radio. Finally, the outer layer is the application of the core art works which is created through imagery or

function in fashion, advertising, and design. Products in this PhD research are plotted in the outer layer where core creative arts are used as an inspirational resource for design applications rather than creating original artworks.

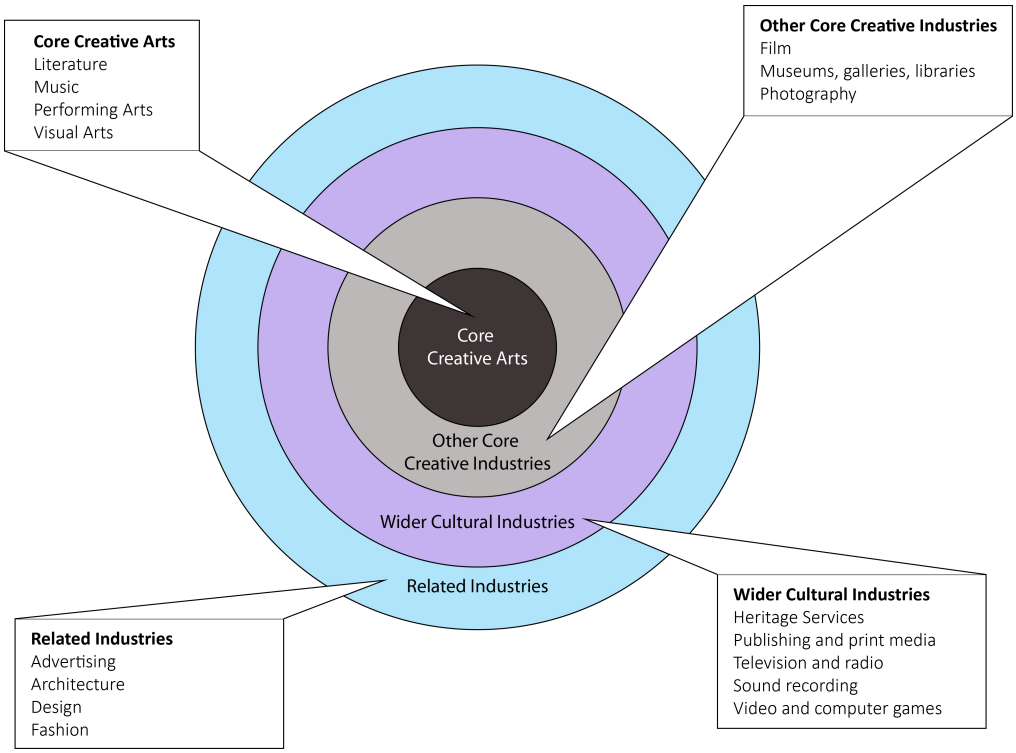


Figure 2.3 The concentric circles model of the cultural and creative industries (**Adapted from** Throby, 2008)

Cultural products are profitable for cultural and creative industries because of the symbolic and cultural value they deliver to consumers. Cultural and creative industries take culture as a resource to generate and communicate symbolic meanings with their consumers (Throby, 2008). Galloway and Dunlop (2007) suggested symbolic meanings are one of the main characteristics of cultural and creative industries as well as products with symbolic meanings can make profits from the cultural value. The value of incorporating culture into design was also explained by Hesmondhalgh (2013) that cultural industries are producers who deliver social meanings by artefacts and products. In the same vein, Lawrence and Phillips (2002) stated that cultural industries are firms and companies which are working on promoting not only the usefulness of products, but giving symbolic values and

meanings to products. Ravasi and Rindova (2008) also believed that symbolic value of products enable consumers to express themselves and show their social identity. The cultural symbolic meanings and values of products are the key elements that make cultural and creative industries a profitable business.

2.1.3. What is a Cultural Product?

Cultural products are an outcome of integrating culture, design, and business. Products which are relevant to the aforementioned cultural and creative industries are regarded as cultural products (Voon, 2007; DCMS, 2001; Throsby, 2001; UNESCO, 2000). The categories of cultural and creative industries identified by UNESCO (2000) and DCMS (2001) overlap and have similar examples. Categories used by both sources include: advertising, architecture, arts and antiques, crafts, heritage goods, design, designer fashion, film and video, television and radio, interactive leisure software, software and computer services, music, manufacturing of musical instruments, performing arts, publishing, sports and cultural tourism.

Cultural products differentiate themselves from standard products because of their aesthetic and symbolic value (Scott, 2004). A combination of culturally-specific meanings integrated into the form of a product could be pleasant for consumers (Ravasi, Rindova and Dalpiaz, 2012). Besides, cultural products can be seen as a presentation of cultural value and they could show their owners' social identity (Voon, 2007; Aiello and Cacia, 2014). That is to say, cultural products can serve as a communication media that users could express their aesthetic appreciation, social value, and affection to others (Moalosi et al., 2005).

Most importantly, a cultural product should be a representative of the culture in which it is recognised. In other words, cultural recognition is the key point to identify cultural products. In this research, the cultural products particularly refer to souvenirs, which involve the visitors' emotions and memories of their journey.

2.1.4. Cultural Product Design Models

Since cultural features are regarded as a main characteristic of cultural products, designers play an important role to make a meaningful link between products and consumers. Designers decode, interpret, and transfer cultural features into products based on their local cultural references in order to show the cultural identity correctly (Cardoso, Queiroz and Gontijo, 2009). Thus, some studies emerged proposing design models and design processes to assist designers for creating cultural products. These studies, which will be discussed in this section, include proposing a cultural design model (Lin, 2007), a culture-oriented design model (Moalosi, 2007), design procedures (Teng and Chuang, 2011; Nijkamp and Garde, 2010), and design techniques (Chow and Jonas, 2010; Wu and Na, 2006). Another example of providing a cultural resource is the Taiwanese aboriginal cultural digital archive database which has already been established to provide designers with inspirational resources (Lin, Cheng and Sun, 2007).

A culture-oriented design model was proposed by Moalosi (2007) to help designers create products with Botswana's cultural features in the initial stages of the design process. The model suggests that designers integrate socio-cultural factors from users' perspectives to create cultural-oriented products. That is to say, users' cultural background and experience as well as current technology have to be well-integrated to create a cultural-oriented product which can meet users' needs aesthetically and functionally. The practical applications of this model use design resources such as indigenous artefacts, local aesthetic experiences, and the nature of Botswana to create their cultural products.

A further cultural product design model was proposed by Lin (2007) to provide designers with a way to think about cultural meanings, then create a scenario, and ultimately design a preferable product with local cultural features. In this model, there are three main stages of applying cultural features on a product: identification, translation, and implementation. Cultural features are initially identified from an original cultural object, including its colours, patterns, and materials. Then, the

identified cultural feature is translated by integrating functions of the products and users' emotions to create a suitable scenario for a cultural product. Lastly, designers synthesise cultural meanings, features, design methods, and story-telling by understanding the whole background in order to implement a creative cultural product. Lin has highlighted the importance of creating a scenario for cultural products and this can be helpful to make a connection between the products and their consumers. Similarly, Moalosi (2007) has adopted a design process of identifying and transforming social-cultural factors from folktale scenarios of Botswana's culture into product design.

In parallel to Lin's three stages of creating cultural products, Teng and Chuang (2011) proposed another three stages as preparation, transition, and design development. In the preparation stage, Teng and Chuang travelled to locations to photograph cultural features, whereas Lin's previous work indicated that cultural inspiration could simply come from artefacts. In the stage of transition, Teng and Chuang put more emphasis on materials and users' habits, while Lin suggested using a folklore scenario to make a deeper meaningful connection between products and users. As a final point, similar to Lin's implementation stage, Teng and Chuang used the term 'design development' to mean the process of completing of the products.

The aforementioned research claimed similar design processes to conceive cultural products with different research focus. A comparison of three design models and procedures of cultural products is shown in Table 2.1. It begins with extracting features from local culture, followed by imitating or transforming these cultural features into creating new products. Design models and procedures suggested by researchers above are similar, however, they put emphases in different parts of design process. Moalosi, in particular, highlighted socio-cultural factors which takes users' behaviours, habits, emotions and aesthetic values into account. Whereas, Lin emphasized the importance of storytelling and creating a scenario for a cultural product. The approach by Teng and Chung focused on involving designers into the cultural environment. From the research performed, it can be seen that there is a

gap in the design approach for cultural products. While previous authors illustrated clear design processes, the focus of their studies was on ways of collecting or transforming cultural features in product design. However, a guidance of retrieving applicable features from a culture was not discussed. A classification of cultural features is, therefore, important because it can provide guidance to designers in the early stages of the design process; it can help them make informed decisions by examining the previous use of cultural features.

Table 2.1 Design processes of cultural products

Author(s)	**Moalosi**	**Lin**	**Teng and Chuang**
Year	**2007**	**2007**	**2011**
Types of Models	Culture-oriented design model	Cultural product design model	Procedure of observation and design of cultural experience
Design Process	Integrating socio-cultural features from users into product design.	1) Identification 2) translation 3) Implementation	1) preparation 2) transition 3) design development
Cultural Resources	Folktales from Botswana	Objects from Taiwan indigenous culture	Architecture, objects and food from a historical city of Taiwan.
Research Focus	Using local culture as an inspirational resource in their product development	Infusing cultural features into product design with a meaningful scenario.	Emphasizing designers' emotion and experience before integrating cultural features into product.

Design models and procedures proposed from the previous studies can help designers in their design process, whereas knowing what consumers want also needs to be considered when designers are creating products. Shin, Cassidy and Moore (2011) divided target consumers for Korean cultural products into three groups: young and trend-conscious generation, tourists, and designers. The group of tourists consisted of Western and Asian consumers. In this PhD research, consumers are

divided into groups of Eastern and Western populations in order to explore the differences between the preferences of these consumers.

2.2 Design Methods of Cultural Products

Studies which provided design methods for graphic, product, and interior design fields will be discussed in this section. These studies provide similar methods of translating or integrating cultural information into design applications.

Freeman, Evans and Lipton (1990) suggested three types of Oriental design and decoration in interiors; these categories all use elements of an existing artwork by either replicating the original, employing characteristics, or applying the functional use. The most common way of using cultural features is to imitate the original artform such as adopting the whole set of the original architecture or gardens in a new environment. Alternately, employing characteristics of art form such as the colours, motifs or forms of Oriental arts, crafts, and artefacts can create an exotic ambience. These two ways can make a visual impact of an Oriental atmosphere, whereas applying functional use of original practical items that can be beneficial for modern life. For instance, the mechanics of folding screens are used to create foldable furniture to save more space in overcrowded cities.

In addition, Steiner and Haas (1995) suggested four types of design methods for cross-cultural graphic design. Firstly, they suggested using 'iconography' which is adopting exotic images to present foreign ambience; this method is considered to be the most straightforward design method. Secondly, 'typography' is the way to adopt characters, rather than images, to create an Oriental ambience. Thirdly, 'symbolism' is regarded as a higher level of abstract concept than iconography and typography because the objects applied have been transformed or displaced to reinvent a new design. Finally, 'ideography' is the most abstract and spiritual way in which a simple image could represent many layers of meanings such as a traditional Taoist symbol, TaiChi.

Popovic (2002) focused on the emotional aspects of translating and integrating cultural features into design. He concluded that:

- Simple and logical cultural information on a product can convey the cultural value appropriately
- Applying the five senses can enhance human emotional responses to cultural features
- Form, shape and colour extracted from artefacts can arouse their aesthetic experience and positive emotional responses.

Rompay (2008) suggested that using design methods such as 'metaphor' and 'analogy' can bridge symbolic meanings and products in a design practice as well as contribute to a novel product. 'Metaphor' means when a new object is understood through relating it to another existing object or phenomenon; for example, a trash bin icon is used in a computer interface to mean deleting data. It also means the new experience of using a product while connecting with his or her past experiences (Lakoff and Johnson, 1980). For instance, people may know how to use a new phone based on their knowledge of previous phones. Therefore, designers can use design methods such as transforming, abstracting, deconstructing, and integrating original features to create products (Teng and Chuang, 2011; Wu and Na, 2006) where the features may not look the same as their original form, but are still understood by consumers.

'Analogy' means two types of objects which share a similar feature or function (Rompay, 2008). An example of 'analogy' using features would be a small coin bank or keychain that resembles a red English telephone box. Thus, designers can use design methods such as imitating original art works, forms, or functions to create products.

In summary, design methods are classified into three types. Design methods suggested by previous studies for different design fields, which were shown Table 2.2, can be in parallel with one another. Firstly, the original source can be directly

duplicated onto products without any changes. Secondly, some factors of cultural features can be selected, simplified or transformed, but the cultural feature is not radically changed. Finally, part of a cultural feature can be recognised in a product even though the original feature has been deconstructed, abstracted, or minimalised to some extent.

Table 2.2 Design methods

<table>
<tr><th>Authors</th><th>Freeman et al</th><th>Steiner and Haas</th><th colspan="2">Wu and Na</th><th>Methods applied in current products</th></tr>
<tr><td>Year</td><td>1990</td><td>1995</td><td colspan="2">2006</td><td>current</td></tr>
<tr><td>Applied field</td><td>Interior</td><td>Graphic</td><td colspan="2">Product</td><td>Cultural products</td></tr>
<tr><td rowspan="5">Design methods</td><td>Duplicate a form</td><td rowspan="2">Iconography</td><td rowspan="3">Imitate</td><td>Direct imitating (image)</td><td>Yes</td></tr>
<tr><td rowspan="2">Apply an image</td><td>Direct imitating (usage)</td><td>Yes</td></tr>
<tr><td>Typography</td><td>Indirect imitating (abstract)</td><td>Yes</td></tr>
<tr><td rowspan="3">Apply a structure</td><td rowspan="2">Symbolism</td><td colspan="2">Deconstruct</td><td>Yes</td></tr>
<tr><td colspan="2">Digging principle</td><td>Yes</td></tr>
<tr><td>Ideology</td><td colspan="2">Apply structure</td><td>Yes</td></tr>
</table>

Additionally, Shin, Cassidy and Moore (2011) proposed three ways for cultural reinvention within product design, as shown in Figure 2.4, which consist of 1) transformation of the design elements. 2) transformation of the functional usage of cultural products; and 3) integration of design elements, functional usage and traditional features. The design methods of integrating of cultural features are mainly discussed in the previous studies, the integration of functional usage is particularly emphasized for an industrial product design in Shin, Cassidy and Moore's study. Thus, design features, cultural features, and functional usage are the main

factors that can be manipulated by design methods such as imitating or transforming to reinvent cultural products.

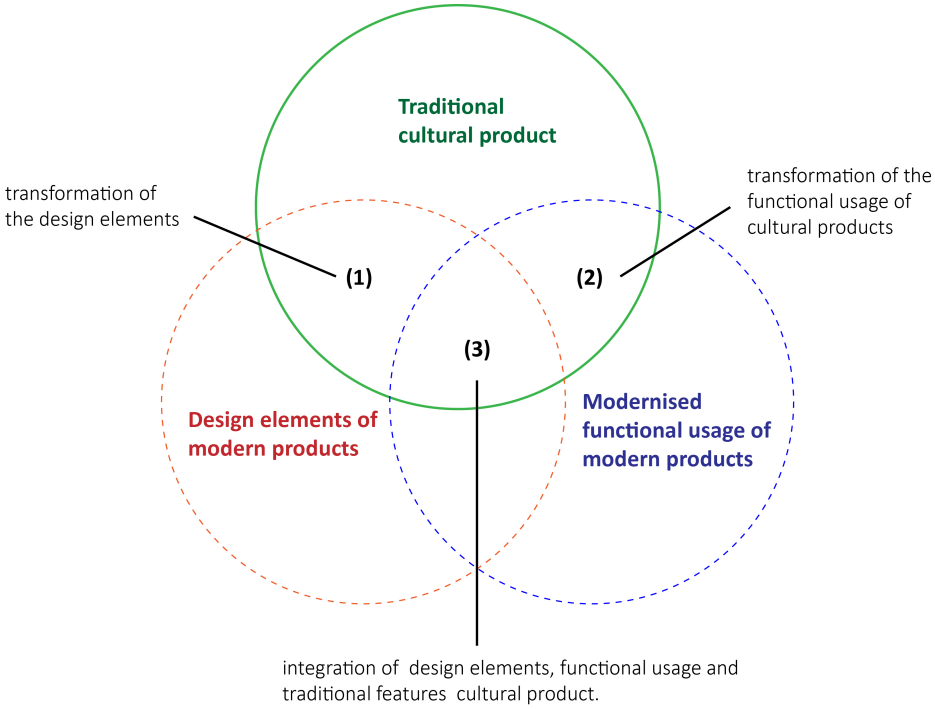


Figure 2.4 The three options for cultural reinvention with product design

(Adapted from Shin, Cassidy and Moore, 2011)

2.3 A classification of cultural features

Chinese cultural resources were chosen for this thesis because there is a trend in Eastern countries to promote local cultures via products as well as to show their uniqueness in a global market. A cultural feature is a distinctive characteristic which represents a culture. Cultural features which are presented in a tangible or visible form are easier to be recognised and applied. Therefore, a classification of visual features can be beneficial for designers in the design process when selecting a cultural feature suitable for their products.

A classification of cultural features is summarised from the definitions of culture (in section 2.1.1) and design practice. Culture is demonstrated through a variety of objects, activities, and environments by various authors. Art and artistic activities

have been considered as intelligent and creative activities (Throsby, 2001; Williams, 1988). Artefacts are regarded as representative cultural objects (Hatch, 1993; Freeman, Evans and Lipton, 1990; Schein, 1985; Kroeber and Kluckhohn, 1952). Social customs, which can be represented through fashion and social activities, can also be a presentation (Kroeber and Kluckhohn, 1952; Throsby, 2001). Lowie (1937) identified that food that is specific to a region can also be a significant factor to represent the preferences of local people. Religion, a way that people appreciated what they were given from the God, is an early definition of culture (Williams, 1988; Hofstede and Hofstede, 2005; Throsby, 2001). Finally, nature, where a group of people reside, affects culture (Eagleton, 2000; Fatma, 2006).

Furthermore, some design researchers have stated that cultural features can be applied to interior design and fashion design. Freeman, Evans and Lipton (1990) concluded that the key feature of Oriental style in interior design is derived from lavish colours and sophisticated artefacts. In the fashion design field, Fatma (2006) classified cultural features into five parts: garments, historic and ethnic costumes, artefacts, and nature.

Therefore, the cultural features summarised from the aforementioned definitions of culture (section 2.1.1) and design practice can be collected and categorised as:

I) Art and Artistic activities (Throsby, 2001; Williams, 1988),
II) Artefacts (Hatch, 1993; Freeman, Evans and Lipton, 1990; Schein, 1985; Kroeber and Kluckhohn, 1952),
III) Customs (Kroeber and Kluckhohn, 1952; Throsby, 2001),
IV) Food habits (Lowie, 1937),
V) Architecture (Voon, 2007),
VI) Religion (Hofstede and Hofstede, 2005; Throsby, 2001)
VII) Nature (Eagleton, 2000; Fatma, 2006).

These categories derived from general definitions of culture and, therefore, the categories could be applied in most of the cultures. There are seven general categories that can apply to every culture. This research, however, focuses

particularly on Chinese culture and thus the general categories of cultural features were broken down into nine subcategories in order to give more examples of the culture category. For instance, handwriting, painting, printing, and origami are derived from art and artistic activities; utensils and objects are included in artefacts. Seven general categories of cultural features are identified below (Table 2.3). The categories could be seen as a growing system where designers can adjust or expand the subcategories in their practical use.

Table 2.3 Categories of cultural features

General category	Chinese cultural features	Descriptions of the cultural features
Art and artistic activities	1. handwriting and painting	Elegant penmanship as an art or profession
	2. printing	Texts or images which are duplicated on paper by a template or machines
	3. origami	Folding paper into a representational shape without cutting
Artefacts	4. utensils and objects	Found objects previously made by humans
Customs	5. customs	Traditional activities or behaviours among a specific group of people
Food	6. food	Things to eat
Architecture	7. architecture	Creative building which is a combination of art and science
Religion	8. religion	Worshiping a particular god or gods in any belief system
Nature	9. nature	The physical world which is not made by people

Art and artistic activities

1) Handwriting and Painting

Traditional handwriting and paintings present the aesthetics of that time. Oxford online dictionary (2014) defines calligraphy as “beautiful handwriting or written characters and elegant penmanship as an art or profession”, while Merriam-Webster online dictionary defines painting as “the art or act of making pictures using paint.” In Chinese culture, calligraphy and paintings were made on a piece of silk or a Shuen paper by using brushes, ink, and Chinese pigments.

2) Printing and paper cutting

Cambridge online dictionary (2014) defines printing as "texts or images which are duplicated on paper by a template or machines." Printing in this research specifically refers to the traditional art forms including stamp printing, movable type printing, or any artistic type of printing. For example, seal carving is an art form combining calligraphy and the technique of making stamps. The technique of seal carving is to engrave characters on the surface of a stone and then stamp it on a piece of paper using red or black ink paste; these engraved characters can be a name of a person or a place, a sentence, or a poetic verse. The stamp could symbolise the social status or the power of the owner, for example, a specific big square seal was a symbol representing an ancient King.

3) Origami

Origami is made by folding paper into a representational shape without cutting. This art form can be used for decorations or delivering wishes (Merriam-Webster online dictionary 2014). Folding hundreds of paper cranes as a gift means wishes, blessings, or good luck for the recipients. Also, origami folding skills have been utilised in medicine, science, electronics, and technology. For example, an application can be as large as solar panel arrays in space such as those created by a Japanese astrophysicist Koryo Miura in 1995 (Nishiyama, 2012) or can be tiny as a stent graft which can be inserted into a blood vessel (Kuribayashi, 2004).

4) Artefacts -- utensils and objects

Artefacts are found objects previously made by humans. In addition, Cambridge and Oxford online English dictionaries describe 'artefacts' as utensils -- such as implements, instruments, or vessels -- for diverse uses in a household, kitchen, or performance. Fans were created a long time ago in ancient China. The fans were made into shapes such as circles, semi-circles, squares, or palm leaves; they could be used for increasing airflow, in theatre performances, or as a medium for painting and

calligraphy. Modern products have applied the foldable function of ancient fans to make new items such as portable keyboards and foldable tables.

5) Customs

Customs are described by Merriam-Webster and Oxford online English dictionary as traditional activities or behaviours of a group of people such as their habits, social events, or fashion. For instance, paper cutting is one of the Chinese customs which was normally used as a decoration of windows, doors, mirrors, and lamps in homes, especially during Chinese New Year or at a wedding celebration. Auspicious patterns are the most common theme; they are usually symmetrically cut or engraved on red papers. These red paper cuttings mean wishes, good luck, happiness and blessings. Another example of customs is traditional dress which can also be representative of a culture and its aesthetics. The company Alessi used this custom by applying the traditional dress of the Chin Dynasty to their kitchenware designs.

6) Food

Food is defined as one part of a culture (Lowie, 1937) and regional recipes demonstrate the different eating habits from one culture to another. Foods such as Japanese sushi, Korean kimchi, or English fish and chips can be easily recognised for the cultures they represent.

7) Architecture

Architecture is creative design of buildings which is a combination of art and science (Cambridge online English dictionary 2014). Traditional architecture was created using local materials to represent particular aesthetic approaches and professional techniques. The structure and form of traditional buildings are often applied to create a modern product. For instance, a form of traditional pillars in a temple was utilised to create supports of a desk.

8) Religion

Religion is worshiping a particular god or gods in any belief system and may include rituals, festivals, or ceremonies. Statues of Buddha or the cross of Jesus symbolise different beliefs and can be used to show the cultures where these religions are popular. Less-formal versions of these religious images and statues have been produced for people to enjoy in their homes; these new versions have been achieved by changing proportions or colours to make them attractive or humorous.

9) Nature

Some landscapes that are unique to an area, native plants, and native animals can represent a culture, as culture can be the outcome of the interaction between humans and nature. Similarly, Moalosi (2007) suggested that nature contains its symbolic meaning in the local culture. For example, fish in Chinese culture are a symbol of wealth and happiness.

2.4 Applied Design Features on Cultural Products

Product form or appearance dominates consumers' pleasure (Creusen and Snelders, 2002). Its visible features can carry cultural meanings of products which allow people to interpret or interact with the products (Ravasi, Rindova and Dalpiaz, 2012). Design features of a cultural object can be classified in various ways. Ranawat, Tuteja and Holtta-Otto (2012) explained a Four Dimensions (4D) framework of design features which was created by Peter McGrory. Design features were grouped into 4 dimensions as shown below:

- 1D: colour, material, and texture
- 2D: shape, pattern
- 3D: form, function, physical feature
- 4D: concept, story, philosophy or brand

Some design features from the 4D framework have been selected for this research because they have been applied in cultural product design; the selected features are colour, icon, image, line, material, pattern, shape or form.

Colour of a product plays an important role in users' emotions. It is not only visually perceived but has psychological effects (Slack, 2006). Each colour in different cultures and countries implies different symbolic meanings. For instance, red implies happiness and good fortune in Chinese beliefs. White is used in funerals in Eastern culture while it is used in weddings in Western culture. Moreover, different colour matches can refer to a certain culture or elicit certain emotions. For example, any interior which is coloured by cinnabar red, gold, and black is perceived as luxurious by Japanese culture (Freemand, Evans and Lipton, 1990).

Icon / symbol 'Icon' and 'symbol' are both simplified graphics, but there is a slight difference. 'Icon' is a simplified graphic that stands for an object or a person and it can be understood without explanation. For instance, figure shapes of male and female for toilets are icons which people can easily understand beyond cultural boundaries. However, 'symbol' is given a meaning which is understood via education (Ambrose and Harris, 2003). For example, a symbol of Yin and Yang refers to a philosophy of Chinese culture.

Image can deliver a lot of information effectively in comparison to written words and it can be interpreted in various aspects based on the viewers' cultural background (Ambrose and Harris, 2003). Modern image software programmes can be used to manipulate and alter images using effects such as: retouching, exposure blending, filter controlling, enhancing photo compositing, distorting, applying a vintage effect to photos. Currently, images of traditional art are frequently applied to products that are sold in souvenir shops or museum gift shops.

Line is from one given point to another and the path between the points can be straight, curved, bent, or broken. Some lines are visible and obvious such as lines which are drawn on a paper or a surface by any stick, brush, or tool. Also, lines can be visible but intangible as beams of light. However, some lines are invisible; they

can be recognised because a correlation between two points is implied (Poulin, 2011; Zelanski and Fisher, 1996; Bates, 1975; Malcolm, 1972). For example, star constellations that are used in the zodiac rely on implied lines between stars to create their shapes.

Material plays an important role in a product, since the form and function of the product can be radically affected by choice of material (Doordan, 2003). Materials chosen for a given product could be selected from state-of-the-art technological creations, existing substances, or materials which are not normally used to make the product (Slack, 2006). Users' sensorial perceptions toward materials used in products is emphasised by Karana, Hekkert and Kandachar (2008), because cultural meanings, values, and associations can be elicited from the chosen material.

Pattern is regular repetitions which can be perceived as visual harmony (Macnab, 2012) and these patterns can be easily observed in or inspired by nature such as the repeated shape in a honeycomb. Pattern is composed of a motif that is replicated without any change. Traditional decorative patterns of artefacts, rugs, and tiles are frequently applied to the surface of a product.

Shape or form is generally used in place of each other, as they are both contours of a figure. A flat figure is regarded as shape while a three-dimensional figure is considered as a form. Shapes/forms can be geometric, organic, and random (Poulin, 2011). Shapes or forms are associated with their functions. The five basic geometric shapes/forms are circle, cross lines, triangle, square, and spiral, which imply different meanings in every culture. For example, a circle can imply the meaning of reunion, wholeness, or the entire universe (Macnab, 2012). In a design, an area which is filled or closed is considered to be positive space. On the contrary, an area which is empty or open is considered to be negative space. Negative space should not be overlooked as it can work in opposition to positive space in order to create visual illusions (Zelanski and Fisher, 1996).

Structure is defined by Merriam-Webster online dictionary as "something (such as a house, tower, bridge, etc.) that is built by putting parts together and that usually

stands on its own." In most Chinese architecture, timber is largely used for buildings and there are many unique structures for wood-built architecture. For example, a tenon is a very common form of joinery which connects wooden supports without using metal nails. The function of these multiple interlocking tenons is to support or transfer the weight of horizontal beams and vertical columns. Also, in traditional Chinese architecture the supports in a structure were designed in a symmetric pattern and can be engraved or painted.

Techniques are described as special skills to make objects (Merriam-Webster online dictionary, 2014). For example, when making a paper cutting it is the artist's skills and knowledge of the craft that is used to develop their methods or technique; this can be seen by the designs and shapes they can achieve through cutting. Another example is that some origami, which can present delicate shapes, has been folded through the artist's technique of mathematical planning. Modern design has applied technique, such a those found in paper cutting and origami, to materials such as metal or plastics.

Summary

A key characteristic of cultural products is a feature which can be an expression of cultural values. A literature review was conducted to answer the research question 'what are the cultural features that characterise a cultural product?' In this chapter, understanding evolving definitions of 'culture' led to conclusions about potential features of Chinese culture, in which nine categories of cultural features were classified (section 2.3). A cultural product can be created by utilising cultural features, design features (section 2.4) and design methods (section 2.2) to deliver the cultural value. Previous researchers have proposed design models and processes for cultural products, however, how cultural products are perceived emotionally by the consumers has not been investigated in previous research. Therefore, the next chapter will introduce how people process information and how products are perceived emotionally.

3

HUMAN EMOTION AND COGNITIVE PROCESS in PRODUCT APPRAISAL

Affection is the human appraisal system which allows people to judge and make decisions (Khalid and Helander, 2006b). The information we perceive can arouse our emotions based on our senses, knowledge, memories, and experience. The information process will be introduced in this chapter. Additionally, products are the focus of this thesis where the designers deliver the meanings and values to their users. The meanings and values can enhance users' emotional attachment to the products and this can help the products differentiate themselves from other similar products on the market. Emotional assessments, which can help designers to position their products, were developed by previous research to investigate human emotional feedback and how they can inform product design. Information processes, affection, user experience, and emotional assessments are aspects of cultural product design that will be discussed in this chapter.

We are surrounded by information in our daily life. It is, therefore, important to understand how people select the information they need and how they ignore what is not important for them.

Wickens et al (2004) explained that people perceive information from their senses and useful information is selected for processing. Figure 3.1 shows that when information reaches the brain, it is filtered by the senses and the perception of the selected information is affected by our own experiences that are stored in the long-term memory. Our long-term memory contributes to interpret the sensed information and to give meanings (in section 3.5.3) to an object or a situation. While the perceptual information accumulated by stimuli from the environment through our senses is defined as a bottom-up (stimulus-driven) process, the perception sensed from prior knowledge or past experience (long-term memory) is called a top-down (knowledge-driven) process (Wickens et al., 2004).

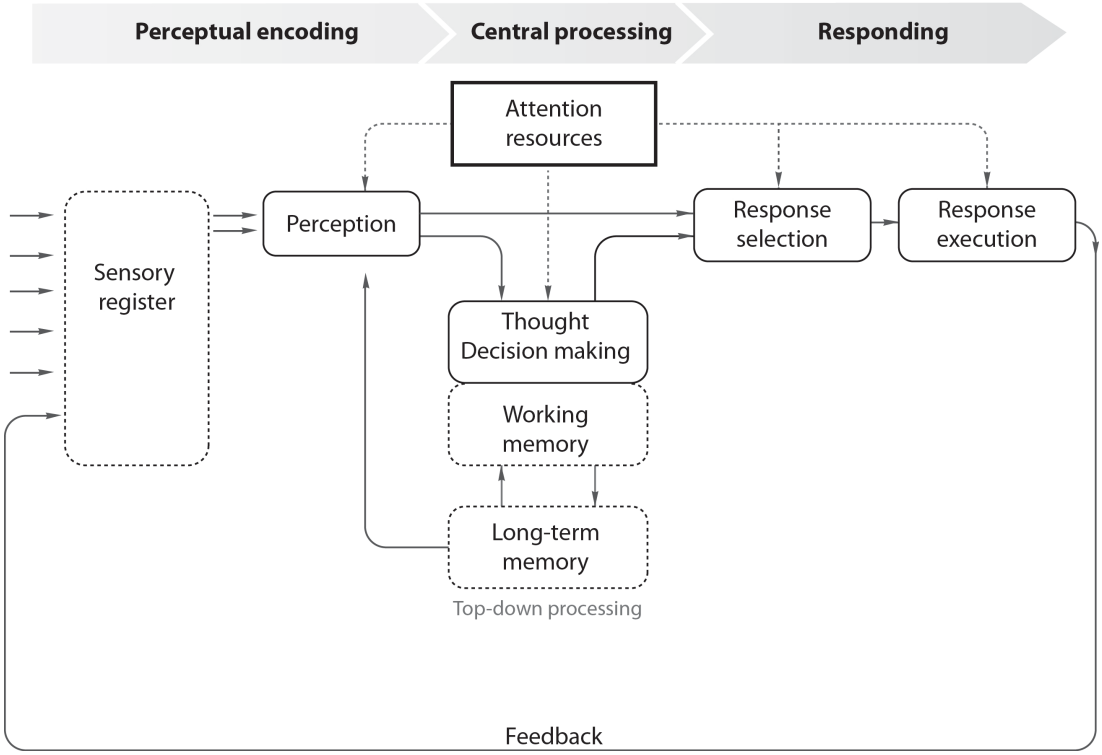


Figure 3.1 A model of human information processing (Adapted from Wickens et al, 2004, p.122)

3.1 Attention is How We Select Information (Bottom-up /stimulus-driven) process

As we perceive most information with our eyes, Ware (2008) distinguished our visual system in three stages as meaningless low-level features, sophisticated patterns, and meaningful objects which are shown in Figure 3.2. In the first stage, *feature processing*, millions of information features -- such as orientation, colour, size, and motion -- are processed at the same time to give a holistic picture of visual images. Then, in the *pattern processing* stage, the large amount of feature information is refined and linked together in order to establish continuous contours such as the shape or outline of an object. Finally, in the *objects processing* stage, due to the feature information being reduced and useful feature information being integrated, continuous contours can be then identified as complete and meaningful objects based on our focus, interests, and needs (Ware, 2008).

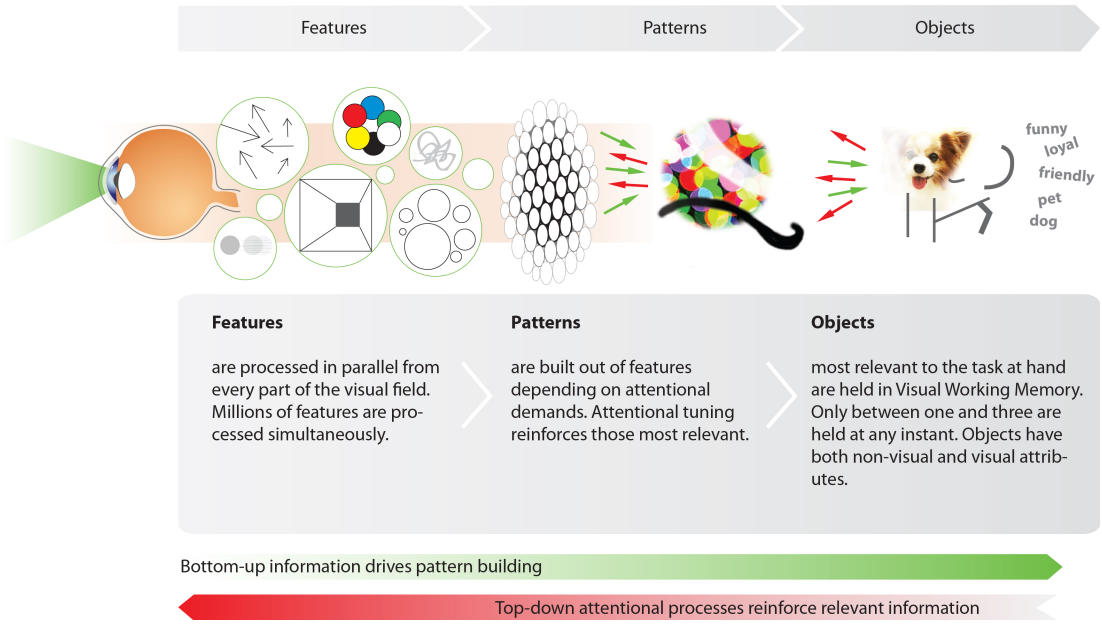


Figure 3.2 Visual information process (adapted from Ware, 2008)

In the bottom-up process, our visual perception discerns or groups the feature information as a pattern or an object (Ware, 2008). Similarly, Mather (2006) suggested three stages of the visual process, as shown in Figure 3.3. In the first stage,

numerous fragmental features of an image -- such as lines, colours, materials, or space -- are developed in order to constitute an image or a shape for the next stage. In the second stage, these features are integrated to present complete shapes. In the final stage, objects can be recognised because of the accumulation of shapes and surfaces, which are integrated in the previous stage.

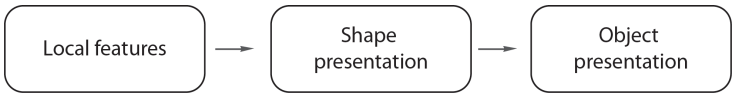


Figure 3.3 Three stages of visual processing (Adapted from Mather, 2006)

Conversely, Gestalt theory which was undertaken by three German psychologists -- Max Wertheimer, Kurt Koffka, and Wolfgang Kohler -- tried to explain and suggest principles of how humans organise visual features into groups in order to form a shape (Ash, 1995). They claimed that humans experience an object as a whole and the whole is not only a collection of all features, but the influence of features between one another to act in synergism (Heider, 1973). Taking the star sign for example, the closer stars were grouped together to form a shape in human visual perception. The Gestalt principles broadly influence modern art and design (Behrens, 1998).

The bottom-up process refers to the ways that our senses perceive and organise information in the mind. We perceive feature fragments -- such as lines, colours, or materials -- to form a shape or object and our visual perception. These feature fragments are elements that create cultural features (refer to section 2.3) and design features (refer to section 2.4) in a cultural product. Gestalt principles, which suggest rules of how humans' eyes and brains group visual elements, can be helpful for designers to apply and consider in the design process when creating a cultural products.

3.2 Semiotics and Products (top-down / knowledge-driven) process

In the top-down knowledge-driven process, the information we perceived, such as meanings of objects, is understood or interpreted based on our knowledge or social conventions. Philosophers, such as Saussure and Peircean, formulated models of how humans create and interpret meanings of signs, which is also called semiotics. Peircean declared that a sign itself has no innate meanings; instead, meanings are given to a sign which could be shown as images, patterns, or objects (Peirce and Hoopes, 1991). That is to say, signs could stand for the meanings beyond the sign itself. Taking the icon of yin-yang for example, the sign is a circle with half black and half white; there is one white dot in the black space as well as one black dot in the white space. The sign stands for Taoist spirituality in the Chinese philosophical concept.

Saussure (1983) claimed that a sign, in the linguistic perspective, is a composition of signifier and signified. Chandler (2007) further explained that signifier is commonly described as the physical form of the sign -- such as sounds, images, or smells -- while signified refers to the concept or meaning of the sign. For instance, the word 'close' is a signifier and the concept of 'close' could be signified as a store is closed for business. Thus, a sign needs to be interpreted and learnt by experience or education.

Similar to Saussure's argument, Peirce (1991) declared three basic modes of a sign which are 'index', 'icon', and 'symbol' by its different degrees of conventionality between signifier and signified. 'Index' refers to a sign which is directly related to its meaning, so it can be easily observed or sensed without learning, such as drawings of natural signs: sun, lightning, or clouds. 'Icon' means a sign and its meaning are similarly related so that it can be perceived and understood, such as a female or male icon on a restroom door. 'Symbol', which is based on social conventions, represents a sign which can only be understood by education, such as the Christian cross. Meanings of an object are created and interpreted by people who are within the same culture or society and a sign acts as a communication media (Peirce, 1991).

Furthermore, Sebeok (2001) explained that a sign system is an innate reflection of humans' senses, emotions and intelligence. Thus, a sign system is created and interpreted by people and can be served as a communication media to express their thoughts and emotions.

Gains (2014) stated that culture plays the key role which enables people to interpret and understand meanings and values. Most of the cultural features can be regarded as symbols, because people can only interpret appropriately based on the knowledge of their social conventions. Since a sign system can also be seen as a reflection of human emotions (Sebeok, 2001), cultural features which are a part of the sign system contain an emotional link with people who understand it. In this research, this emotional link is investigated regarding different cultural features.

In addition to perceiving information based on knowledge, humans also interpret information by their experience. For instance, Rompay (2008) claimed that the symbolic meaning of a product can also be based on user experience (refer to section 3.3) which results from the interaction between the person and his/her environment as well as the relationship between the object and the person. People perceive products not only from the forms and materials which give functions to the products, but also the social conventions where the meanings are given to the objects (Rompay, 2008). Products can, therefore, serve as a communicational media to deliver messages based on the interaction between humans, environment, and products. Designers are regarded as information senders or communicators to deliver meanings through products.

Guiraud (1975) stated that signs in different environment or context will deliver different messages or meanings. Therefore, he suggested two types of communication of signs: 1) objective and logical signs and 2) subjective and aesthetic signs. The denotation of objective signs draws people's attention, while the connotation of subjective signs immerses people's emotional participation. The example Guiraud gave in his book was a policeman wearing his uniform. When a policeman wears his uniform regulating the traffic, the uniform in this situation is a

representation of the social function; the meaning of the uniform is objective. However, if the policeman wears his uniform to attend a funeral ceremony for a colleague, in this case the uniform shows its honourable representation in a formal ceremony. The meaning of the uniform at the funeral is a subjective expression where the person in the uniform devotes his emotional participation.

Muller (2001) also suggested that every product has two functions: primary and secondary function. The primary function of a product is the physical or visible form which can fulfil people's task-needs. For example, a chair is created for sitting. In addition to the primary function, the secondary function of a product is the invisible meaning of a product which is associated with human behaviours, social conventions, or environment. For example, a table designed for a kitchen will differ from a table designed for office use.

The communication process of signs, shown in Figure 3.4, was illustrated by this research to summarise the previous studies. The figure is an integration of studies by Guiraud, Rompay, and Mulle regarding interactions between people, objects, and environment. The process begins with designers who create products as a media to communicate with their consumers. Then, it moves on to products which provide visible forms as well as invisible meanings in the process of communication. In this process, interaction between people and objects is mainly based on the visible forms of the product, while the interaction between people and the environment in which the product is created is based on the understanding of social and cultural meanings. Finally, interactions between people, products, and environment result in the product experience.

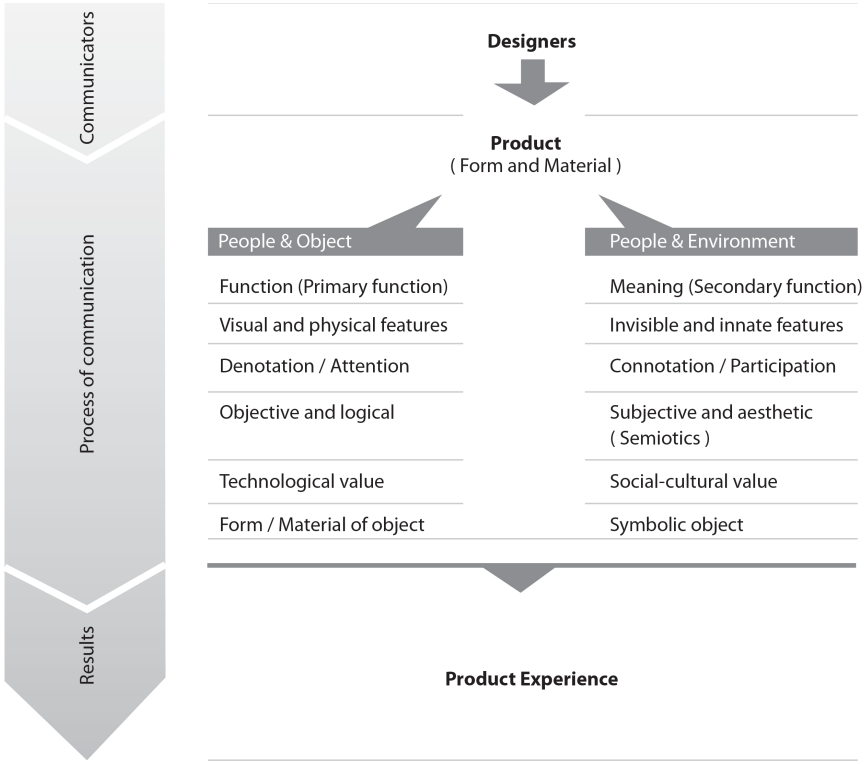


Figure 3.4 Communication process of signs
(illustrated by author; Guiraud, 1975; Muller, 2001; Rompay, 2008)

Furthermore, in the communication process of signs (Figure 3.4), it can also correspond to the ways people perceive information which are both bottom-up and top-down processes. The interaction between people and product is a bottom-up process where people perceive the physical and material products by their senses. The interaction between people and environment is a top-down process where people understand and interpret meanings based on their knowledge or experience.

3.3 The Concept of User Experience

Experience is an individual's subjective evaluation based on feelings from the past (Frijda, 1986). The term 'user experience' stems from human-computer interaction (HCI) and is used to encourage programing designers or groups to focus on the issue of beyond task-related usability (Hassenzahl and Tractinsky, 2006). Forlizzi and

Battarbee (2004) categorised different approaches of understanding experience into three aspects as product-centred, user-centred, and interaction-centred. Product-centred approaches usually suggest criteria which may be shown in a form of a checklist that needs to be fulfilled. User-centred design approaches emphasise users' needs, goals, and actions when they are interacting with their products. The user-centred design approaches help designers to understand people more than just focus on usability of products. Interaction-centred approaches investigate the relationship between users and designers via products. Therefore, human emotional responses, meanings of products, and users' appraisal of the products are included in the experiences of user-product interaction. The focus of user-product experience has been moving from functions and usability of products to social experience of users and the interaction between them.

Desmet and Hekkert (2007) proposed a framework of product experience which explained that emotional experience is provoked by consumers' appraisals toward products (Figure 3.5). Consumers' appraisals are based on the 'aesthetic experience' of products and users' 'experience of meaning'. The aesthetic experience relies on design features (refer to section 2.4) of the product which are perceived from our senses (Blijlevens et al., 2012). The 'experience of meaning' results from an individual's memory related to the product or interpretation of the metaphor that the product implies. Finally, both 'aesthetic experience' and 'experience of meaning' contribute to our emotional experience. This emotional appraisal process stands as a key point for consumers' decision making.

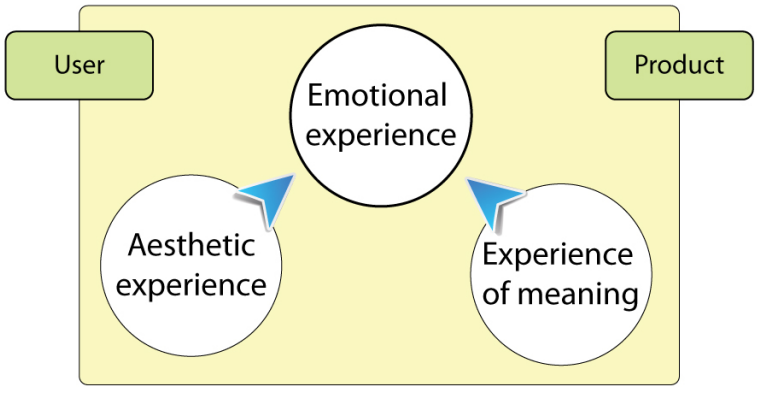


Figure 3.5 Framework of product experience. (Adapted from Desmet, 2007)

Hassenzahl and Tractinsky (2006) claimed that 'user experience' is a synthesis of users' internal status and the characteristics of products within a context. This is illustrated in their proposed model of user experience, as shown in Figure 3.6, based on user-product interaction in three perspectives: emotion and affect (users' perspective), beyond the instrumental (product perspective), and the experiential (interaction perspective). Firstly, in contrast to technological aspects of products, 'emotion and affect' toward products has been emphasised in the relationship between users and products. Secondly, since usability is no longer the only concern for products, 'beyond the instrumental' refers to other aspects that should also be considered, such as the beauty of the products or user identity. Thirdly, 'the experiential' refers to the interaction between users and products. At the intersection of the three perspectives is where you find the holistic user experience. That is to say, user experience is an outcome of people interacting with products and the experience is not limited to the usability but also related to users' affective states.

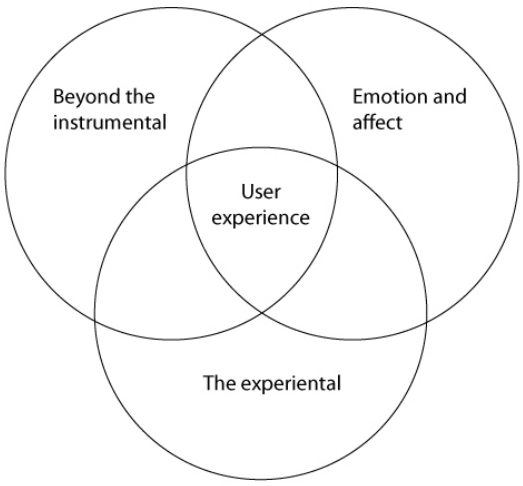


Figure 3.6 Facets of user experience (Adapted from Hassenzahl and Tractinsky, 2006)

In the same vein, Hekkert (2006) specified user experience as product experience which means "the entire set of effects that is elicited by the interaction between a user and a product, including the degree to which all our senses are gratified

(aesthetic experience), the meanings we attach to the product (experience of meaning), and the feelings and emotions that are elicited (emotional experience)" (Hekkert, 2006, p.160). In other words, product experience is based on the interaction between users and products and a product is appraised as positive or negative depending on the users' concern. If the outcome meets the goal of users' concern, it is a positive emotion; on the other hand, if results are delayed or frustrated, it leads to a negative emotion (Lazarus, 1991).

A positive or negative interaction between users and products will affect the longevity of the products. Savas (2004) defined positive interaction between users and products as product attachment and product attachment will be a strong connection which can extend the lifespan of the products. Jordan (2000) further explained pleasure in different types with respect to various interactions with products. Firstly, physio-pleasure, the pleasure is aroused from physical senses such as visual, auditory, or tactile. Secondly, socio-pleasure, the pleasure is experienced when products can represent the owner's social identity. Thirdly, psycho-pleasure, it relates to people's emotional responses or satisfaction when using a product to reach a goal or finish a task. Finally, ideo-pleasure, it is derived from a concern of an issue such sustainability, aesthetics, and those which can manifests values.

Norman (2004) argued that "attractive things work better" in his book Emotional Design and proposed three levels of emotional processing which are visceral, behavioural, and reflective (Figure 3.7). Firstly, visceral level is the most primitive sensory response. It is a sensory evaluation of how we feel and what we perceive by our senses. We can then quickly make an adjustment corresponding to the situation. For example, when we are in danger, our muscles tense in order to react for running or attacking. Secondly, human behaviour is subconscious in this level and it is a cognitive assessment that people can act automatically under routine operations or learning. Taking piano players for example, they can play the music smoothly and play the piano proficiently without thinking about what is the next note to play after lots of practice and skilled performance. The reflective level then is the place where

people consciously interpret things and have spiritual enjoyment about it. Thus, values are formed through their training, education, experience, and culture. For instance, when people go to museums to watch art exhibitions, their enjoyment is derived from the aesthetic appreciation of the art. This affective process explains how the emotion is triggered during the process of information perceived and human reaction. The process includes natural reactions against environment, skill-led subconscious behaviour, and consciously reflective thoughts. Thus, the emotions that triggered from cultural products are considered as in the reflective level where people have spiritual enjoyment through understanding and interpreting the cultural meanings of the products.

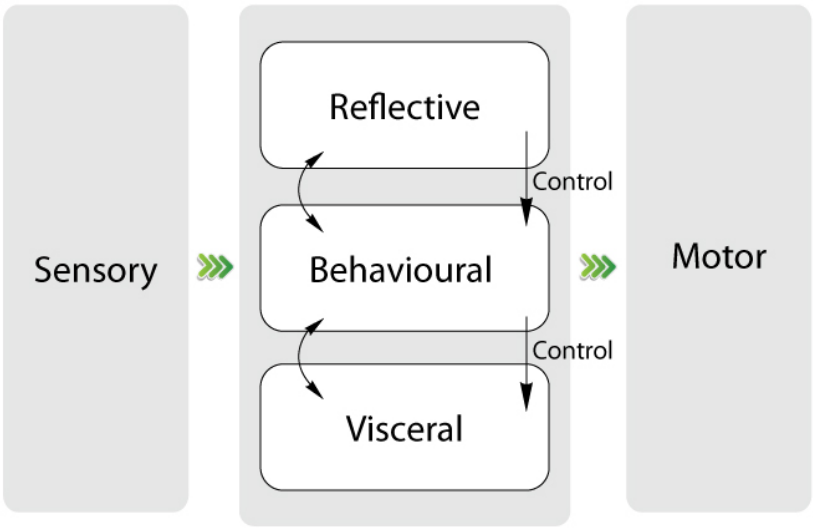


Figure 3.7 Three levels of affective process in product experience according to Norman (Adapted from Norman, 2004)

Van Gorp and Adams (2012) proposed the A.C.T (Attract, Converse and Transact) model according to different levels of emotion involved (Figure 3.8). In the *attract* stage, aesthetic attributes of a product which allow consumers to perceive physically by their senses can attract consumer's attention and arouse their desirability. In the *converse* stage, the interaction between products and users is a focal issue where the ease of use of the products is concerned. In the *transact* stage, consumers get

emotionally involved and attached to the products which can reflect consumers' personality or social identity in a long term. When a product can meet these three criteria, it can make a long term relationship with its owner. Correspondingly, IDEO Human-Centred Design (HCD) Toolkit (IDEO, 2009) recommended that designers to consider three lenses of products, which are desirable, feasible and viable. The desirability is firstly identified to know what people want. Then, feasibility of technology as well as financial viability is considered. Both studies emphasised the importance of desirability when the emotions are triggered.

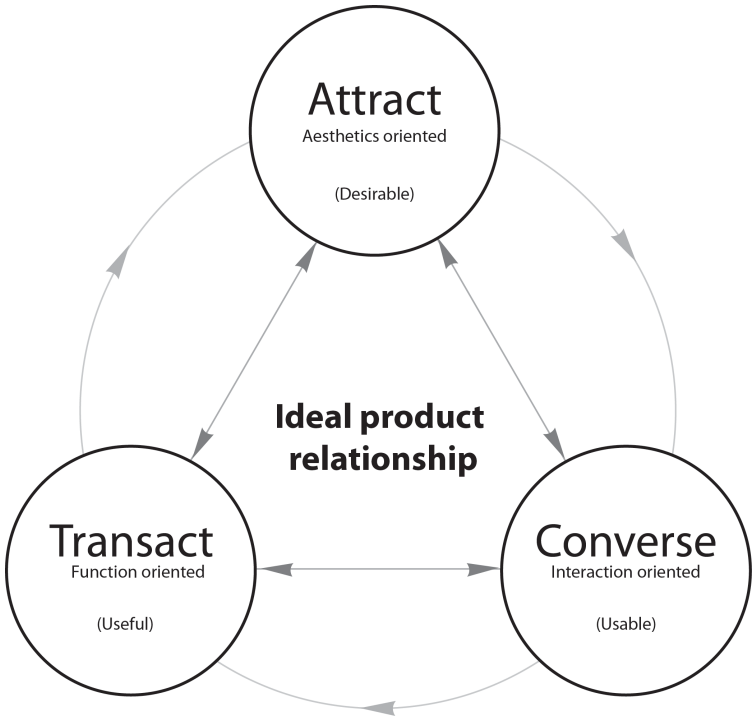


Figure 3.8 The A.C.T Model (Adapted from van Gorp and Adams, 2012)

Affection is the human appraisal system which allows people to judge and then make decisions from the information they perceived (Khalid and Helander, 2006b) and it has also been emphasized by current research in user experience. Additionally, product appearance and the meanings it carried can affect how people feel and interact with the products. In this research, cultural features are the main factor that

affects product appearance and emotional appraisal of the cultural products will be investigated.

3.4 Affective Status

In psychological perspective, 'affect' is the judgement system that can promptly help people to react when perceiving whether their environment is safe or dangerous. Affect includes consciousness and sub-consciousness; most of the sub-conscious reaction comes earlier than conscious ones. The affective system allows people to make any decision quicker than the cognitive system (Khalid and Helander, 2006a).

Since Scherer (1984) suggested using a term affective states to refer to emotions, many researchers (Fredrickson, 2001; Gross, 1998; Batson, Shaw and Oleson, 1992) also agreed that affect is a more general idea to cover conscious feelings such as emotion, mood, and trait. Norman (2004) highlighted four aspects of affective states which are distinguished by their duration and association with objects: emotions, moods, sentiments, and personality. The four affective states will be described in the following sections. Furthermore, Desmet (2002) concluded that these four aspects can be plotted by their intention and duration as shown in Table 3.1. Intention refers to whether affective states are elicited by objects and duration refers to the time it lasts. For example, emotion is elicited by a certain object and lasts for a short period of time. Therefore, emotion is acute and intentional.

Table 3.1 Affective states (Adapted from Desmet, 2002)

Affective states	Intentional	Non-intentional
Acute	Emotions	Moods
Dispositional	Sentiments	Emotional traits

Alternatively, Russell (1980) regarded affective states as more inter-associated than isolated. He presented affective states in a bipolar dimension space, as shown in Figure 3.9. The horizontal dimension is axis of pleasantness, which is from misery to

pleasure; the vertical dimension is axis of excitement, which is from sleepiness to arousal. In addition, he further identified eight affective states as arousal, excitement, pleasure, contentment, sleepiness, depression, misery, and distress (Fig. 3.9, shown in black). He also suggested 28 emotional words based on the previous main affective states (Fig. 3.9, shown in grey). Furthermore, Russell and Barrett (1999) conceived certain conscious affective feelings, which are not necessarily elicited by objects, as core affect. They identified core affect as "neurophysiological state consciously accessible as the simplest raw (no reflective) feelings evident in moods and emotions", such as alert, excited, elated, happy, contented, serene, relaxed, calm, fatigued, lethargic, depressed, sad, upset, stressed, nervous and tense (Fig. 3.9, shown in red). The focus of this thesis will be the affection which is elicited by objects.

Figure 3.9 Eight affect concepts (in black), 28 affect words (in grey) and 16 core affect (in italic and red) in a circular order. (Modified from Russell, 1980 and Russell and Barrett, 1999)

Similarly, followed Russell's two dimensional space, Ekkekakis (2013) concluded contemporary dimensional approaches of affective states into a model of four variants within Russell's two-dimensional space of core affect (Fig 3.10).

Affective states can be characterized along two dimensions as pleasure and arousal or they can be categorized into four aspects due to its association with objects and time duration. Firstly, the four aspects of affective states will be further discussed in the next session in order to identify an affective state for this research, followed by further discussing about affect words, emotional descriptors, in section 5.2.

In this section, affective states were discussed in a psychological perspective in order to identify a term for this research. Once the term is identified, 'emotion' in section 3.5 is specifically in relation to affective feedback from products.

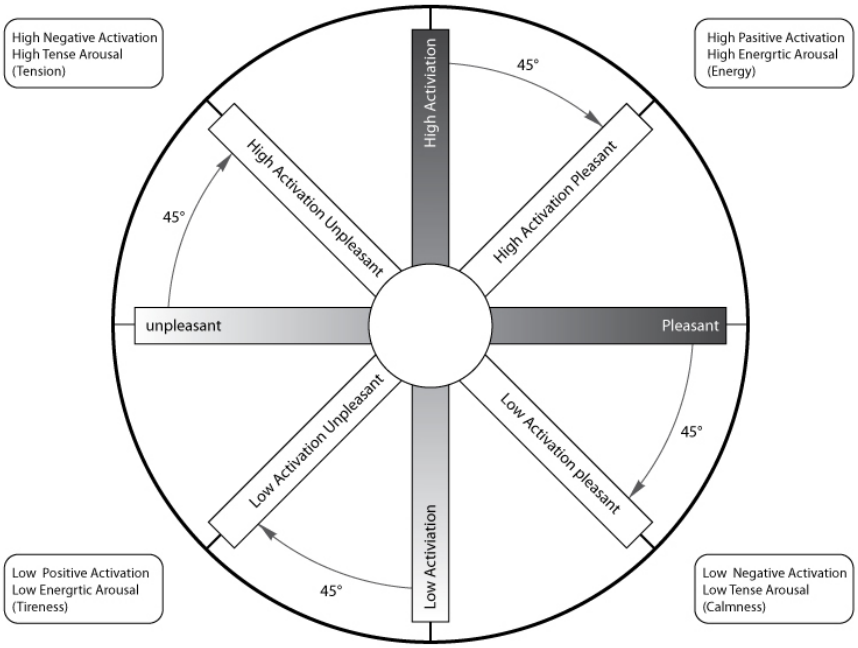


Figure 3.10 Two-dimensional affective space (Adapted from Ekkekakis, 2013)

3.4.1. Emotion

Initially, the issue of emotions was brought up by Charles Darwin in 1872, William James in 1890, and Sigmund Freud in 1895 (Oatley and Jenkins, 1996). Norbert Elias (1938-1982), a German sociologist, began to focus on emotions in his book The Civilizing Process (Stearns, 1993). This turning point brought emotions to be studied in psychological and sociological fields. Emotions, which had been overlooked in the past years, has been emphasized its importance since 1960s in psychological theory

(Lazarus, 1991). Lacking of exploration of emotions in the past is because emotion is difficult to be explained by logical thinking (Norman, 2004).

Following Dewey (1934), emotions are regarded as a moving flow and perform like a magnet, which draws those congenial to it and repels those inappropriate to it instinctively. Ekman (1992) claimed that various emotions share common characteristics; for instance, they are fast and first reaction to a stimulus during a short period of time. He also stated that there are six basic and innate emotions which commonly emerged on our daily life, such as anger, fear, sadness, enjoyment, disgust, and surprised. Similarly, Parrott (2001) suggested a tree structured system dominated by six primary emotions: love, joy, surprise, anger, sadness, and fear (Appendix A). Mapping the six basic emotions with the Russell's pleasure-arousal dimensional space as shown in Fig. 3.11), then it can be seen that surprised and enjoyment are located at a quadrant of arousal and pleasure; disgust, afraid and angry are situated at a quadrant of arousal and misery; sad is sitting at a quadrant of misery and sleepiness.

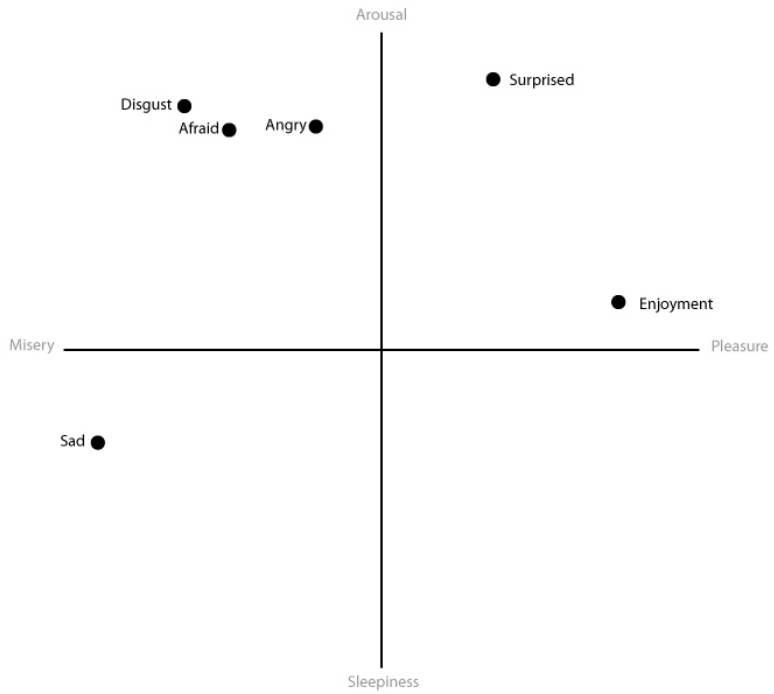


Figure 3.11 Mapping basic emotions in Russell's pleasure-arousal dimensional space

Oatley and Jenkins (1996) considered the terms 'feeling' and 'emotion' as synonyms. However, Damasio (2003) argued that feelings and emotions are different concepts, because feelings, which constitute emotions, tend to be physiological reactions after perceiving an event or object. Though, emotions are a conscious awareness of affect that is associated with an individual's behaviours (Norman, 2004). Thus, emotions are constituted by an individual's feelings, cognition perception, and physical reactions. Emotions can be measured by self-report, because they are intentionally cognitive actions which involve a person's evaluation and appraisal of an object (Frijda, 1993). On the other hand, with the understanding of their own emotions, people can choose to show or hide their emotional expressions (Harris, 1993).

3.4.2. Mood

Nowlis and Nowlis (1956) claimed that the difference between emotions and moods is how long they last and how intense they are. Also, they suggested that emotions come first and they are more intense and rapid which sometimes come with acute reaction, whereas mood is less intense and more stable.

Followed by their study, Ekman (1994) claimed that 'mood' is a sequence of accumulated emotional expressions. When a certain emotion is repeated and intensified, it will gradually generate a mood (Ekman, 1994; Frijda, 1994). 'Mood' is an affective state which stays longer than hours, days, to even weeks (Oatley and Jenkins, 1996). The difference between emotions and moods is that emotion is stimulated by an object, triggered by senses, or influenced by past experiences. However, mood is combined with causes and effects in one's life rather than by an event or an object (van Gorp and Adams, 2012; Clore, 1994).

3.4.3. Sentiment

'Sentiment' is derived from the cognitive process and emotional responses interacting with concerned objects; it involves the appraisal of the objects and the sequent behaviours (Frijda, 1994). Emotions and moods are temporal affect which

interact with a specific current situation and last short period of time, but 'sentiment' comparably lasts longer (even for a lifetime) and comprises an individual's evaluation of the concerned objects.

3.4.4. Emotional Traits

'Emotional trait' is defined as a person's stable affective status corresponding to what one experiences. It could stem from one's hereditary, innateness, or changed in terms of one's experience and environment (Frijda, 1994; Watson and Clark, 1994). That is to say, Emotional traits can be understood as personalities or characteristics of a person or an object.

Summarising from the studies of Ekkekakis (2013) and Frijda (1994), the distinction between core affect, emotions, moods, sentiments, and emotional traits is shown in Table 3.2. These affective states can be differentiated by their duration, intensity, object associated, and the object of appraisal.

Table 3.2 Distinctions between core affect, emotion, mood, sentiments and emotional traits

	Core affect	**emotion**	**mood**	**sentiments**	**Emotional traits**
Duration	Constant	Short	Long	Longer than mood	Over long term
intensity	Variable	High	Lower than emotion	Low	Low
About something	Not necessary	Yes	Possible; not necessary	Yes	Not necessary
Object of appraisal	N/A	Specific stimulus, clearly identifiable	Varies, not easily identifiable	Specific	N/A

(Modified from Frijda, 1994; adapted from Ekkekakis, 2013, p.47)

With respect to various affective statuses aforementioned, Ekkekakis (2013) suggested a three-step process, as shown in Figure 3.12, of how to select an

appropriate measure for affect, emotions, or moods. In the first step, selecting one of the affective states which fits to a research agenda has to be made clearly according to a best understanding of core affect, emotions and moods. Then, considering whether the theoretical concepts of affective states are isolated such as core affect, or dimensional such as pleasure-arousal dimensional space. This can help to define which measurement is appropriate to use. Finally, validity and reliability of available measurements stemming from the previously selected theoretical concepts have to be considered.

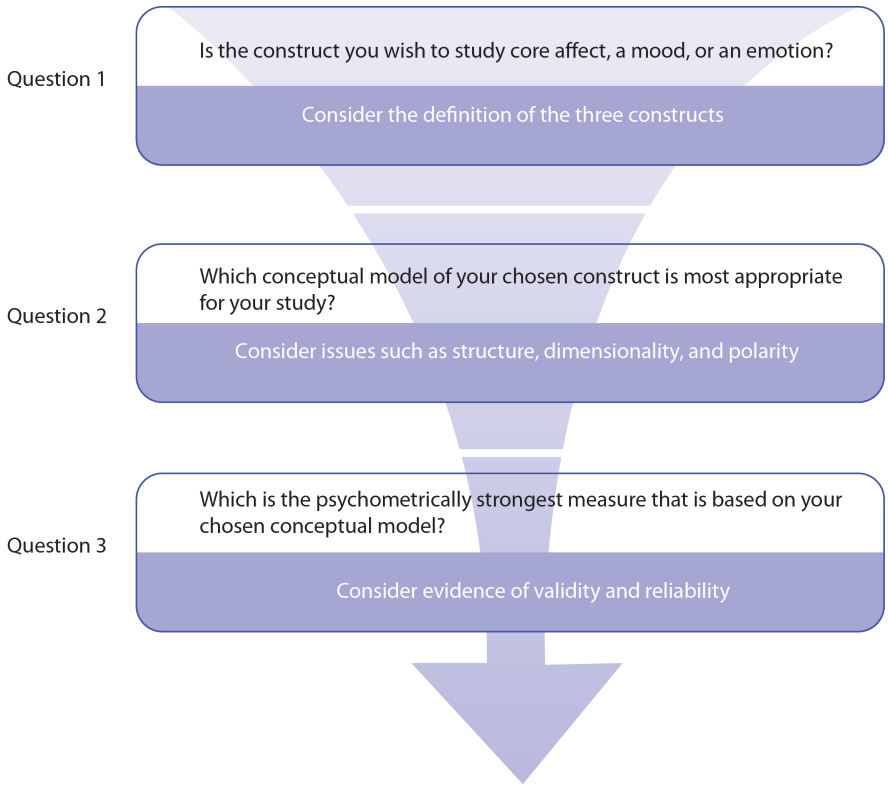


Figure 3.12 The three-step system for choosing a measure of affect, mood or emotion
(Adapted from Ekkekakis, 2013, p.98)

In this research, Chinese cultural products are investigated, and therefore the affective state has to be associated with objects. According to the previous studies, emotions and sentiments are the affective states which are intentional and associated with objects. However, a quick affective response is required in this study because the Chinese cultural products will be evaluated right after they look at the

images of the products. Therefore, 'emotion' is considered the appropriate term to describe the affective state and as a measure for this thesis.

3.5 The Interplay Among Emotions, Values, and Meanings

Emotion is one of the affective statuses and it can affect user experience. The connection between consumers and products could be bridged via the meanings, value, or personality of products which could affect user experience and human emotions. In this section, how emotions, values, and meanings related to each other and how they affect user experience are discussed.

3.5.1. Emotions

In our daily life, we get involved in those things that we like and try to avoid the things that we dislike within a situation or an environment. Our reactions, behaviours, experiences, and memory are the consequences of the appraisal of the situation. All of these contribute to our emotions. Emotion emerges when a person appraises an event followed by an impulse of being either get close to or repel it (Crawford et al., 1992). Many psychologists and sociologists have acknowledged that emotions stand at the very centre of human mental lives, particularly in dealing with significant events (Oatley and Jenkins, 1996; Lazarus, 1991). Emotions tend to be aroused by an individual's needs, attitudes, beliefs, values, and desires (Solomon, 1993) as well as play an important role when people make decisions (Isen, 1999; Damasio, 1994).

It is widely acknowledged that the function and technology of a product are basic requirements for product usage. Since these basic needs are expected to be fulfilled by a product, then emotion plays a key role while customers make their decision when buying products. Designers aim to attract consumers on an emotional level by the aesthetic appearance of products and to extend the lifespan of the products. Emotion is a powerful mechanism to draw attention and initiate a relationship, however, it cannot last for a long time (See also Table 3.2). Shedroff (2009)

suggested that values and meaning build up much stronger and deeper relationships than emotions. He proposed a model of meaning which illustrated different level of meaning as shown in Figure 3.13. The model is a concentric circle and the core level is meaning; from the core to the outer level are meaning, values, emotions, price, and performance. This explains that the appearance and features of objects are the most superficial and they arouse humans' emotion as well as implies the inner essential values and meaning of the objects.

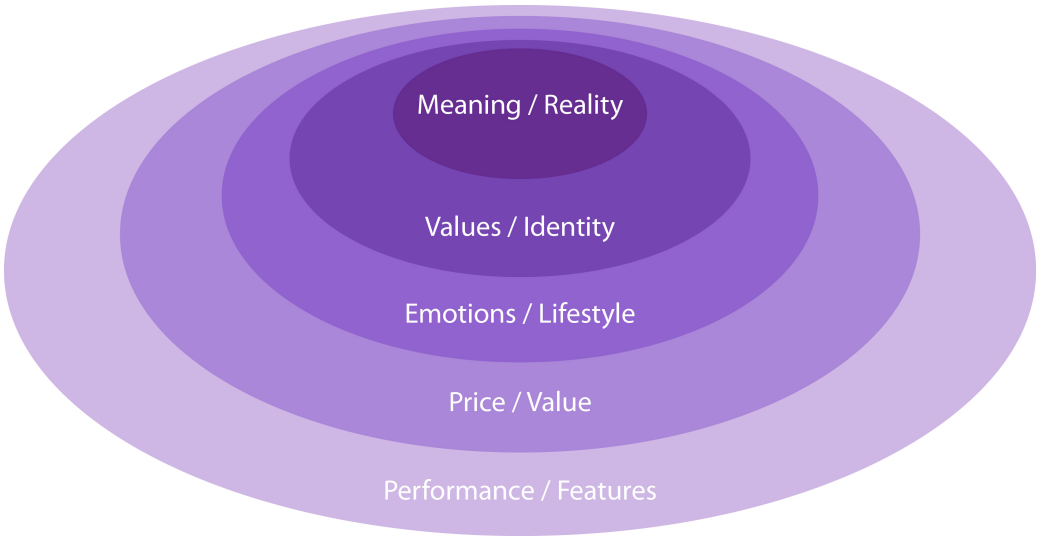


Figure 3.13 The levels of meaning (adapted from Shedroff, 2009 p.112)

According to the previous studies, it can be summarised that emotion is a concern or a result of appraising an event consciously or unconsciously by a person. The result of appraising an event could be positive or negative depending on whether one's concern is enhanced or obstructed. Positive experience has a particularly significant influence on our daily life, because when someone has positive emotions, it will be more liable for making decisions, classifying information, appraising risks, and solving problem (Isen 1999). Emotions are elicited from user experiences (Hassenzahl and Tractinsky, 2006; Hekkert, 2006; Savas, 2004), meanings (Krippendorff and Butter, 1984; Csikszentmihalyi and Rochberg-Halton, 1981), values (Diller, Shedroff and Rhea, 2008; Boztepe, 2007; Allen and Ng, 1999), and product physical design features (Blijlevens et al., 2012; Desmet, 2002). In other words, User experiences, meanings,

and values are delivered by physical properties of an object which provide an interface to communicate with its users. Csikszentmihalyi and Rochberg-Halton (1981) stated that people interpret the meaning that the physical properties of products convey and then have emotional responses to the products. Furthermore, they also mentioned that products which are utilised in a cultural context can encourage people to experience the culture in a direct way. For instance, using chopsticks to eat food for people who are not in the Asian cultural environment may be a way to experience the culture.

Csikszentmihalyi and Rochberg-Halton (1981) also claimed that our needs for an object are not a natural aptitude; instead, it is the relationship between human beings and objects creating the needs. Sanders (1992) points out consumers' needs push an evolution of products, which products have to meet the needs to be useful, usable, and desirable. In a similar view point of Sanders, Jordan (2000) suggested a hierarchy model of consumer needs which is from functionality, usability to pleasurability. He claimed that a basic demand of consumer needs for objects is that the objects have to be functional to fulfil consumers' target. After the functionality is satisfied, then consumers expect objects for the ease to use and in this stage the usability is regarded as a key factor of pleasurability. Finally, the relationship between objects and consumers is more advanced and objects are expected to make consumers feel pleasant. Pleasure, a positive emotion, is experienced when a product is sensory satisfied, showing one's identity, arousing emotional responses, and delivering its value (Jordan, 2000). Furthermore, Schifferstein and Hekkert (2008) identified four key factors which help to enhance human emotional attachment to products; these factors are pleasure, self-expression, group affiliation, and memories. That is to say, people tend to have emotional attachment to their products which make them feel pleased, show their personal identity, express their relationship with other people, or arouse their memory. Similarly, Desmet (2012) revealed that positive emotions are evoked not only by the products itself, but also by the meaning, interaction, and social identity of the products.

3.5.2. Values

Rokeach (1973) defined values as a long-lasting belief which an individual or a social group prefers more than others. Schwartz (1994) further identified values as desirable goals and guiding criteria which are accumulated by the socialisation of a certain group and personal learning experiences, and therefore values can serve as principles for judging and can affect individuals' behaviour.

Allen and Ng (1999) suggested that values in relation to products can be influenced both by utilitarian meaning and symbolic meaning. Their study stated that a symbolic meaning which is implicit and subjective of a product affects the values of the products directly. Instead, a utilitarian meaning which is more concrete and tangible influence human values indirectly.

Boztepe (2007) and Kujala and Väänänen-Vainio-Mattila (2009) claimed that a product doesn't have value itself and values are occurred during the interaction between users' needs and properties of the products. Furthermore, Boztepe (2007) identified four types of user value, which are created in the interaction between users and products within a cultural context. They are utility value, social significance value, emotional value, and spiritual value. Utility value refers to functions or practical usage of a product which allow users to accomplish a task. Social significance value means products which can act as an identity of their owners and the owners can distinguish themselves from others. Emotional value occurs when people experience pleasure, fun or aroused memories which make the products mean something to their owners. Spiritual values stands for the symbolic meanings of products. Diller, Shedroff and Rhea (2008) claimed values as a progressive process which is evolving from functional and economic value toward emotional and meaningful value.

3.5.3. Meaning

'One-size-fits all' fades out while consumers nowadays are looking for products or brands which can express their own social identity. Holt (2004) stated that consumers tend to value products and brands as their personal identity, and therefore cultural value and meanings are embraced in current branding strategy. Thus, the value of a product has evolved from concerning its functionality and technology to considering its meanings. Rindova and Petkova (2007) emphasised a similar viewpoint that a form of the product is not only determined by the current technology, but also by the symbolic and aesthetic attributes which lead to innovation.

An object can become meaningful for a person only when the person's new impression connects with his or her past experience (Arnold, 1960). Csikszentmihalyi and Rochberg-Halton (1981) claimed that meaning of an object is a comprehended transaction process between a person and the object. The transaction process they mentioned includes one's perception, recognition, and attention to the object which leads to its value. The aesthetic appearance of a clock, for example, is physically perceived from its external features and how it is used. Psychologically, the clock is regarded as an important item when it is given by someone special or associated with something memorable. Furthermore, Kleine, Kleine and Kernan (1993) focused on the symbolic meaning of the products within the environment. Symbolic elements or signs play a role presenting abstract conventions, religions, and philosophy in a physical and visible form (Frutiger, 1989). In other words, symbolic meanings attached to the products can be understood and interpreted by people who are in the same cultural group. A current study supported the idea that symbolic meaning of a product has a prominent effect on consumers' evaluation and choices (Creusen and Schoormans, 2005). A product is viewed as a symbol which possesses meanings beyond its appearance and functionality and some products are further used to represent a person's social status or self-identity (Hirschman, 1981).

Similarly, Krippendorff and Butter (1984) claimed that meaning is regarded as a result of communication between users and designers by symbolic signs of products. They proposed a product semantics model, as shown in Figure 3.14, which illustrated the relationship between forms and meanings as well as how users understand the meaning that designers want to deliver. This model shows that both the form which is given by designers and the meaning which is received by users contribute to product semantic within a certain context. Meaning stems from the interaction and communication between humans, objects, and the environment and, therefore, meaning is not an unchangeable property of mind, instead it keeps up with the times (Dewey, 1934).

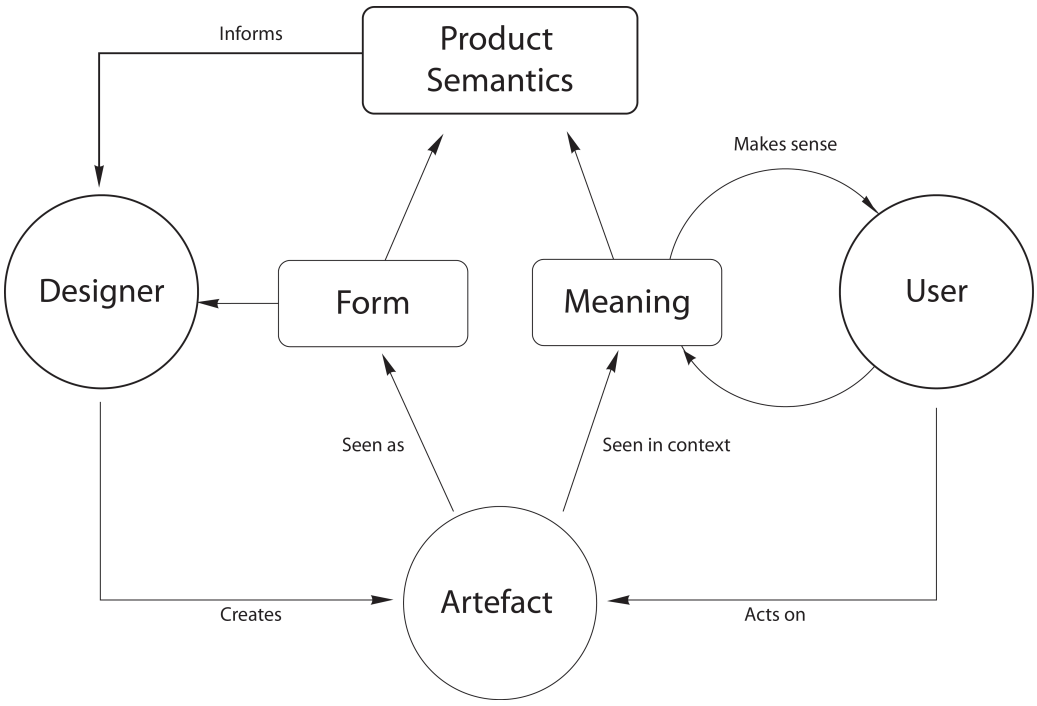


Figure 3.14 Product Semantics model, a relationship of a given form and interpreted meaning (Adapted from Krippendorff, 1989)

Furthermore, Muller (2001) distinguished the communication into denotation and connotation; denotation refers to the basic meaning or the function of products, while connotation refers to the products which were given meaning by the social conventions. Semiotics, therefore, can be considered as the study of how people give meanings to objects such as signs and symbols.

Additionally, Krippendorff (1989) stated that forms actually follow meanings rather than functions and product semantics is based on forms of products, which act as communicators. His research, therefore, suggested four contexts which a product may be involved in with different meanings: operational context, sociolinguistic context, context of genesis and ecological context. Operational context, it is where functions and usefulness of products are concerned. Sociolinguistic context, it is where products are not focused on the usage but how products show the owners' preference and their social status. Context of genesis, it refers to a whole practical making process in the product life cycle; the process initiates from designers' drawing of ideas, engineers' manufacturing of the products, distributions of products making merchandise advertisement, and then presenting to customers. Finally the feedback from customers will contribute to designers' idea. Ecological context, it is focused on the meaning which are received and understood from consumers' perspectives in making sense of their products, such as sustainability of the products and environmental concern issues.

Furthermore, Battarbee and Mattelmaki (2004) divided meaningful product relationships according to how much users get emotionally involved into: meaningful tool, meaningful association, and living object. The products which are classified into the meaningful tool category share the same attributes that the products are needed for a purpose and can be replaced; it is the function of the products that makes the products meaningful. Products in meaningful association refer to those carrying cultural or personal meanings; these types of products represent the owners' personal or cultural identity. Also, these products can evoke the owners' memory or show the owners' aesthetic preference. Products of living objects refer to those which act as companions with characters and souls such as Barbies, bunnies, or toy cars.

Emotions in relation to products can vary based on context. According to Demirbilek and Sener (2003), product semantics and meanings can trigger users' emotional responses in either positive or negative ways. If the product semantics are applied

appropriately, then it can make a positive emotional link between users and objects. Additionally, Karana (2009) suggested that materials play a key role in conveying the meaning between users, products, context and, therefore, the meaning and texture of the materials can affect how users feel about the products.

The reason why meaning or product semantics is important, because they can influence the lifespan of the products and enrich user experience. Chapman (2005) claimed that a durable user-product relationship is established by meanings of a product. Meanings which are based on users' past and current experiences in the context go beyond functions of a product and help to extend product lifespan. The reason why many products are thrown away is not because they are not functional, but they fail to make a meaningful connection with their owners (Chapman, 2005). In other words, products nowadays act not only as a task-fulfil tool but as a meaning carrier that bridges the users and their products. In a study of Kim, Kang and Choi (2014), it was found that the value of meaning increases in a long temporal distance and the meaningful objects tend to be chosen by individuals who have emotional attachment to them. Additionally, the study of Diller, Shedroff and Rhea (2008) investigated the most constant meanings which stem from users' experience in their life by interviewing more than 100,000 individuals across cultures and countries around the world. Their study, suggested a list of fifteen descriptive meanings which can guide companies and designers to evoke some particular meanings for their services or products.

This thesis focuses on the emotional aspect of Chinese cultural products. Cultural features which carry the symbolic meaning are considered the main valuable characteristics in a product. The meaning of cultural products is considered in the sociolinguistic context where the products can show owners' social identity.

3.5.4. Product Personality

Rompay (2008) suggested that symbolic meaning and product personality are key factors which influence product experience (refer to section 3.3). Product personality

stems from the concept of seeing products as living objects which have personality to build up relationships with people and the aesthetic appearance is the media to present their personalities (Jordan, 2002). When a symbolic meaning of a product is described and interpreted as human's personality, it is called product personality (Govers and Schoormans, 2005). Products can also be seen as an extension of oneself so that people can express themselves by their possession (Belk, 1988). Jordan (2002) suggested seventeen pairs of terms to describe personalities of products. Furthermore, Govers (2004) claimed that product personality is strongly affected by its appearance. Some studies proved that product personality is strongly linked to visual product aesthetics (Mugge, Govers and Schoormans, 2009; Brunel and Kumar, 2007; Govers, 2004). Thus, product personality means people describe a product with human characteristics. Product personalities can reflect an individual's personality by the attached symbolic meanings as well as the interaction with people via the aesthetic appearance and functionality.

Moreover, product personality can be designed to make a stronger emotional bond between products and user experience to increase human attachment to the product (Govers and Mugge, 2004). It was also found that product appearance contributes to consumers' aesthetic pleasure (Creusen and Snelders, 2002). Therefore, the emotional bond between products and people can be enhanced by improving the product appearance and attached symbolic meaning.

3.6 Emotion Assessments

Emotion has a prominent influence on our daily life and also affects our decisions. Products like art, artefacts, clothing, and consumer goods can trigger one's emotions correlated with his or her experience. Many studies have worked on evaluating emotional responses by utilising or developing reliable tools. The emotional assessments, especially for product evaluation, are mainly differentiated as objective or subjective approaches (Kim *et al.*, 2012; Mauss and Robinson, 2009; Khalid and Helander, 2006a; Scherer, 2005).

In objective approaches, precise physiological reactions -- such as blood pressure, heart rate, skin conductance, and brain states -- can be measured by specialised equipment; these measurements are understood as non-verbal methods. These approaches can truly reflect individuals' unconscious bodily reaction and can be broadly used in different cultures. However, the approaches are intrusive and may provoke people to resist the test and only limited basic emotions can be assessed by the assessments.

In subjective approaches, self-report assessment is conducted through a given pattern of scales or adjective checklists for individuals to report their emotional experience. For instance, Geneva emotion wheel (Scherer, 2005) is a verbal assessment where written language is used to investigate emotional feedback. Likewise, pictorial assessments were further developed and can be applied to remove the cross-cultural and linguistic barriers. For instance, Self-Assessment Manikin (Lang, 1980) and Product Emotion measurement instrument (PrEmo) (Desmet, 2002) use figures to express the emotions rather than written words. These approaches require fewer technical instruments and make it easier to collect data from considerable amount of individuals' responses. Also, under the premise of participants having the ability and willingness to report their true emotional experience, the best source of information can be collected through self-report assessments (Larsen and Fredrickson, 1999). However, the responses are possibly changed over the time or consciously distorted.

Emotions can also be revealed by behaviour, such as body motions, gesture, vocal and facial expression. The behavioural reactions are easily and consciously controlled to some extent by individuals, and therefore the behavioural assessments, such as Facial Action Coding System, are neither as objective as physiological assessments nor as subjective as self-report assessments. Also, the behavioural approaches are not as intrusive as physiological approaches, because facial and vocal expressions are captured by video cameras and microphones which will not attach to individuals.

However, both physiological and behavioural approaches require highly technical instruments and expertise since they are not easily used.

3.6.1. Self-assessment Manikin Ratings of Pleasure and Arousal (SAM)

Self-Assessment Manikin (SAM) shown in Figure 3.15 was proposed by Lang (1980) to investigate emotional behaviour. SAM has been adopted in behavioural therapy and broadly been used to investigate subjectively emotional experience (Bradley and Lang, 1994; Lang, 1980). The pictorial rating scales of SAM can be used for participants of cross cultures and age barriers as well as in any clinical syndromes. Three emotional dimensions -- *pleasure, arousal, and dominance* -- are measured in SAM. The *Pleasure-displeasure dimension,* as shown at the top of Fig. 3.15 assesses how much an object is liked, pleases, or interests people. The *Arousal-non arousal* as shown at the middle of Fig. 3.15, evaluates how excited an individual has become after viewing an object. The *Dominance- submissiveness* as shown at the bottom of Fig. 3.15 addresses how much freedom does an individual feel in a circumstance. If an individual feels more unrestricted in a situation, then he has a higher feeling of dominance. The figures present degrees of feelings rather than a simple yes or no answer, so respondents can select any figure which best illustrates their emotions when looking at given pictures or objects. The SAM has been applied in marketing and advertising research (Moris, 1995) as well as the International Affective Picture System (Bradley and Lang, 2007). SAM was evaluated as a reliable emotional recognition system that estimated affective experience (Grimm and Kroschel, 2005).

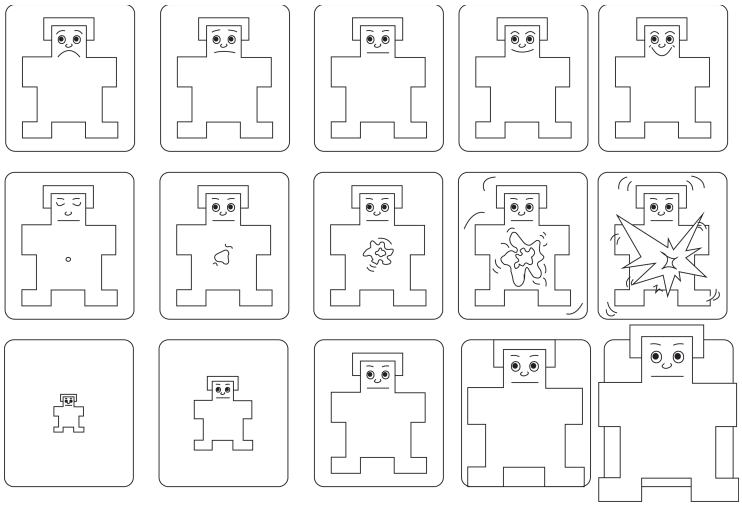


Figure 3.15 Self-Assessment Manikin (SAM; Lang, 1980)
pleasure scale (top), arousal scale (middle) and dominance scale (bottom)

3.6.2. Product Emotional Measurement Instrument (PrEmo)

Product Emotional Measurement Instrument is proposed originally to access emotional experience aroused by the appearance of products (Desmet, 2004). This assessment has been evolving and eventually 14 representative emotions were chosen to describe the emotions evoked by products (Figure 3.16). The representative emotions and different degrees of intensity are displayed by cartoon figures with facial and body expressions. Also, PrEmo was applied to examine emotional responses to cell phone design (Desmet, Porcelijn and Dijk, 2007).

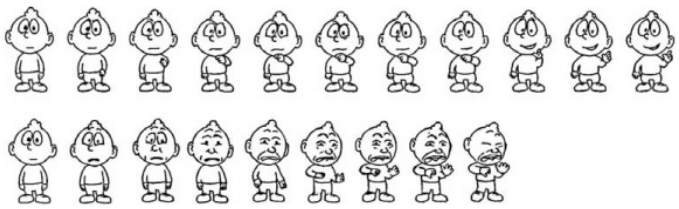


Figure 3.16 Examples of ProEmo measurement (Adapted from Desmet, 2004)

3.6.3. Geneva Emotion Wheel

Geneva Emotion Wheel (Figure 3.17) was developed for assessing consumer experiences within 20 distinct emotion families with underlying two-dimension quadrants (Scherer *et al.*, 2013; Scherer, 2005). The vertical dimension is from high to low control, and the horizon dimension is from negative to positive valence. A respondent can choose from the level of intensity as five degrees of a single emotion one has experienced or even from these 20 emotion families in a circular layout. However, Geneva Emotion Wheel is a verbal assessment which is not easy to adapt for cross cultural use.

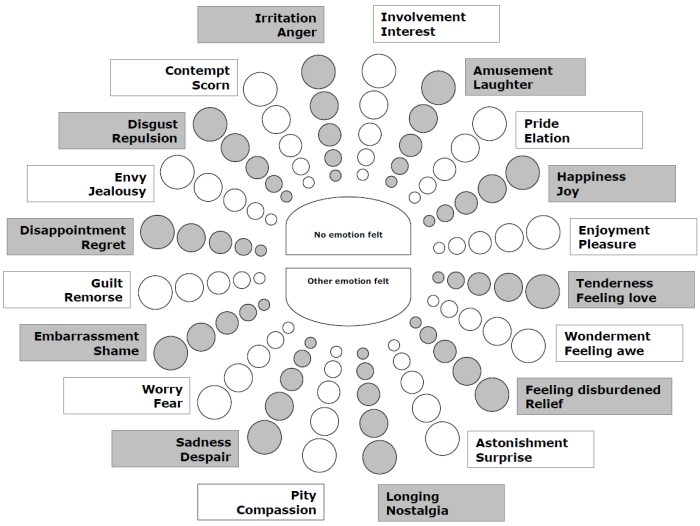


Figure 3.17 Geneva emotion wheel (Adapted from Scherer et al, 2013)

3.6.4. Emoti*Scape

Emoti*Scape as shown in Figure 3.18 is an emotional assessment tool especially adapted to brands and advertising proposed by Ipsos ASI (A global market research company). This assessment is shown on a map with two dimensions: horizontally from negative to positive emotions, and vertically from passive to active emotions. Through customer research, 40 emotional descriptors and correlated visual icons are defined and mapped to develop this assessment (Ipsos, 2005).

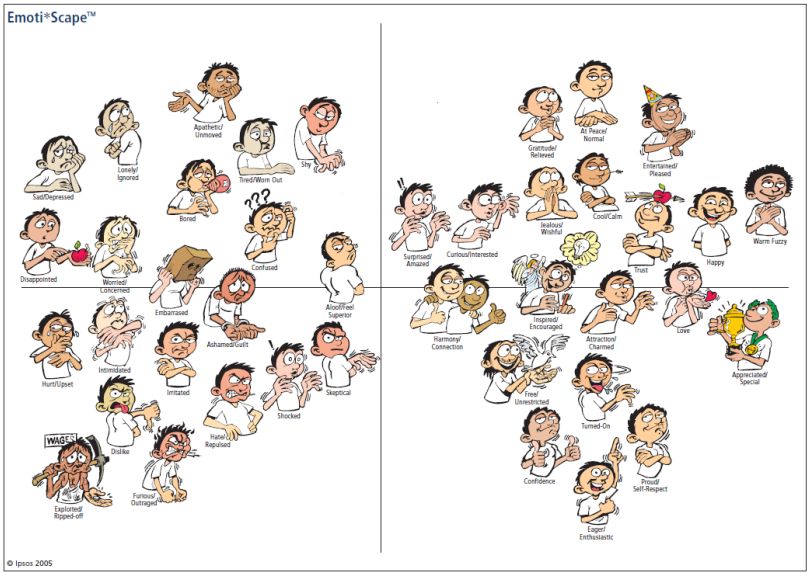


Figure 3.18 Emoti*Scape (Adapted from Ipsos, 2005)

3.6.5. Philip's Questionnaire

While the measurements above consider both positive and negative emotions, Jordan (2000) developed a fixed-response questionnaire which specifically measures pleasure with product-using experience. The questionnaire provided 14 pleasure feelings (stimulated, entertained, attached, sense of freedom, excited, satisfaction, rely, miss, confidence, proud, enjoy, relaxed, enthusiastic, and looking after the product), and for each feeling a 5-point scale was given from strongly disagree, neutral, to strongly agree. This questionnaire has been utilized for assessing pleasure on electronic products by Philips Corporate Design (Jordan, 2000).

Summary

In this chapter, information process was described which help us to understand how we perceive products. The information process is mainly two ways where product form and appearance are perceived in the bottom-up process as well as the meanings or values of products are interpreted in the top-down process. We perceived products from their appearance and physical attributes using our senses. Conversely, we understand and interpret the meanings and values that are given to

the products based on our knowledge, experience, and memory. The forms and appearance of the products serve as a medium where designers deliver their messages to their users, which is called product semiotics. Both physical appearance and intangible meanings of the products can contribute to user emotions and experience. Products which engage consumers' emotions can create a long-term user-product relationship and prolong the lifespan of the products. In this thesis, cultural products serve as the medium which deliver meanings and values of culture in order to keep the traditional values as well as to make emotional links with their consumers. The cultural products, based on the conventional meanings they carried, can present the owners' social and personal identity. The product personality can also express the preference and unique thoughts of the owners.

4

RESEARCH METHODOLOGY

Research topics which are related to human and social life or engaged with the world are included in the field of social research (Punch, 2014; Bryman, 2012). Blaikie (1993 p. 4) defined social research as "exploring, describing, understanding, explaining, predicting, changing, or evaluating some aspect of the social world". Sarantakos (2013) also stated that social research is about discovering and expanding the spectrum of our social life.

The main approaches to conduct social research are experimental methods and empirical methods. An experimental approach is deployed from scientific experiments where a test is under controlled conditions to test a stated hypothesis, and it is also called a deductive research; an empirical method covers a data collection and analysis to solve a social problem and it is called an inductive research (Punch, 2014; David and Sutton, 2011).

This research, therefore, is considered as social research and using empirical methods to collect and analyse the data in order to suggest potential emotional responses from Chinese cultural products. Also, the purpose of the research is to explore the insights about emotional feedback of the Chinese cultural products. Therefore, the research is exploration-based empirical research. This chapter begins by discussing general research approaches and then focuses on design research approaches, followed by the design-related research methodologies.

4.1 General Research Approaches

Research purpose

Robson (2002) categorized three research purposes mainly as exploratory, descriptive, and explanatory. Research questions are developed in terms of the research purposes. *Exploratory* research is conducted when the research field is rarely understood and its insights need to be explored. *Descriptive* research is carried out when an issue needs to be further depicted or the existing knowledge needs to be extended. *Explanatory* research is the most comprehensive one in which the relationships between the issue and correlated phenomenon are concerned.

Research strategies

Research strategies are classified as '*qualitative* or *quantitative'* and '*deductive* or *inductive'*. The first perspective of research strategy is distinguished by whether the main purpose of the research is to develop theory or test theory. The main emphasis of qualitative research is placed on building up theories or exploring social problems through interpreting the social world and it tends to employ an inductive approach (Bryman, 2012; Creswell, 2009). On the other hand, the main focus of quantitative research is put on testing or examining objective theories through collecting and analysing numbered data and it tends to employ a deductive approach (Bryman, 2012; Creswell, 2009). Furthermore, Ramilo and Cinco (2005) stated that the numeric data of quantitative research is collected from hard facts, such as measurements of temperature, which are objectively truth; on the contrary, numeric data of qualitative research tends to result from the measurements of perceptions or experiences, which are subjective situations.

Moreover, Creswell (2009) suggested mixed method research which is a combination of the strength of the qualitative and quantitative approaches and he claimed that it is better than only adopting either of them. Punch (1998) and Bryman (2012) also suggested that the quantitative research could facilitate a qualitative investigation; for example, the statistic results from questionnaire can support qualitative research in depth.

4.2 Design Research Approaches

Frayling (1993/4) suggested three practical categories of research from an art and design perspective, namely 'research *into* design', *'*research *through* design*'*, and *'*research *for* design*'*. 'Research *into* design' refers to research which focuses on theoretical investigations such as design history or design criticism. 'Research *through* design' emphasizes on design processes or activities which assist to achieve a goal or to communicate such as practical experiments, improving materials for products, applying technology to products, or developing design methods. 'Research *for* design' is focused on visual communication via embodied final products or artefacts rather than evolving design processes. Furthermore, Pontis (2010) proposed three types of research which correspond to Frayling's design research categories as theory-based (Research *into* design), practice-led (Research *through* design), and practice-based (Research *for* design). A design project may involve more than one type of category as these research methods are not mutually exclusive (Yee, 2009).

Frayling's categories seem to cover all the art and design research projects based on how research plays a role correlated to design practice. On the other hand, Cross (1999) provided a taxonomy of design research which classified *design epistemology*, *design praxeology,* and *design phenomenology* according to three sources: people, processes, and products. He claimed that as epistemology is a study of the way people know things (section 4.1), *Design epistemology* refers to a 'study of designerly ways of know'. The focus of design epistemology is on the investigation of how people design. *Design praxeology* stands for a 'study of the practices and processes of design' which involves tactics, strategies, tools, and techniques to assist designers in their designing. The focus of design praxeology is on the processes of design in relation to how the avant-garde technology influences the processes. *Design phenomenology* is a 'study of the form and configuration of artefacts which emphasizes the forms, materials, and finishes of products'. The focus of design phenomenology is on products themselves such as how products are crafted or made.

In a recent study, Fallman (2008) provided a model of interaction design research based on design practice correlating with industry, academia, and the society. His model plotted the position of design research activity in a triangular shape of three extremes: *design practice* (design and industry), *design studies* (design and academia), and *design exploration* (design and the society). In the spectrum of design practice, researchers are expected to participate in the project of commercial consultancy or any industry in order to be one of the team actively instead of a passively outside observer. The researchers work with an explicit and suitable research question in mind. Seemingly, the spectrums of *design exploration* and *design practice* are similar. However, *design exploration* aims to ask '*what if*' questions through the process in order to provide an ideal, critical, or alternative solution. Neither product functionality nor consumer needs is considered; instead, desirability, aesthetics, or user experience are emphasised and explored. In the spectrum of *design studies*, it is close to traditional academic research which focuses on describing and understanding design theory, methodology, philosophy, and history.

Additionally, Sanders (2008) proposed an evolving map of design practice and design research, as shown in Figure 4.1, which is a two-dimensional space by *approach* and *mind-set*. In the *approach* dimension, it is from design-led to research-led approach. In the *mind-set* dimension, it is from expert to participatory mind-set. Four main areas are plotted in the map as user-centred design, participatory design, critical design and design + emotion.

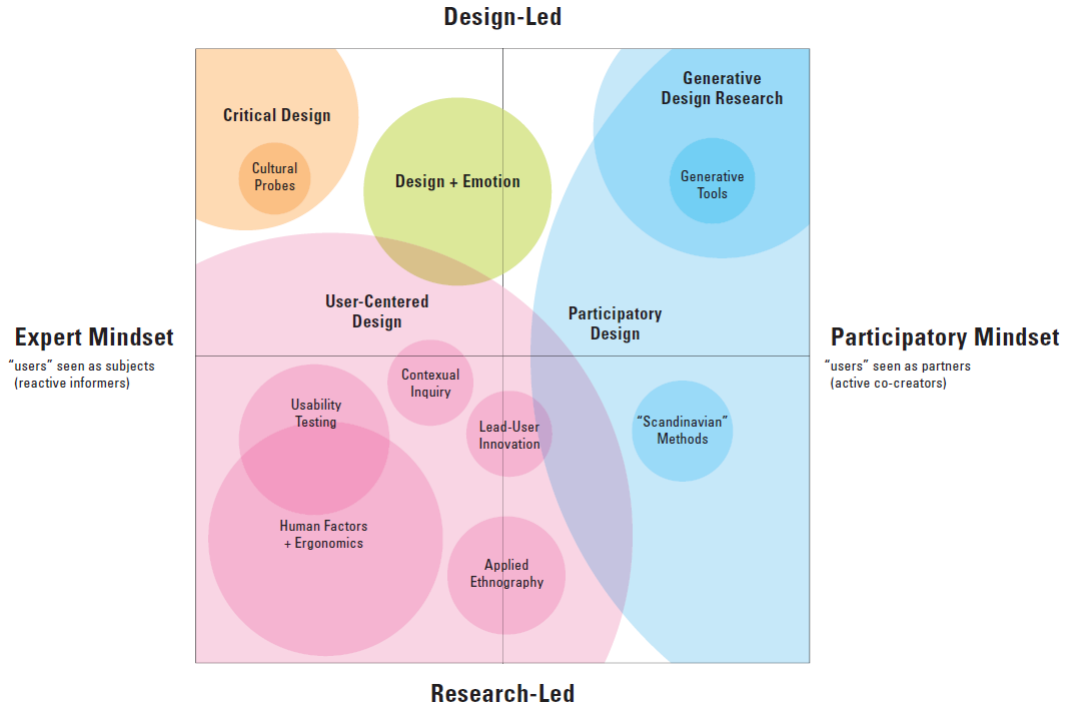


Figure 4.1 Map of design practice and design research (adapted from Sanders, 2008)

4.3 Design Research Methodologies

Three design related research methodologies which differentiate design as a pragmatic science from other theoretical research disciplines were reviewed. They are namely Design Science Research Process Models provided by Takeda et al (1990) and Peffers et al (2006), Design Science Research Cycles suggested by Hevner (2007), and Design Research Methodology (DRM) proposed by Blessing and Chakrabarti (2009).

Takeda et al (1990) proposed a computable design process model (Figure 4.2) to use in computer-aided design system. This model, so called design cycle, includes five steps. The process is from identifying a problem, suggesting key solutions to the problem, developing possible solutions, evaluating these developed candidates, and then adopts the best solution and modifies. In the stage of development and evaluation, any emerged problem will lead to the first step and circulate again. Finally, conclusion will lead to a new awareness of problem.

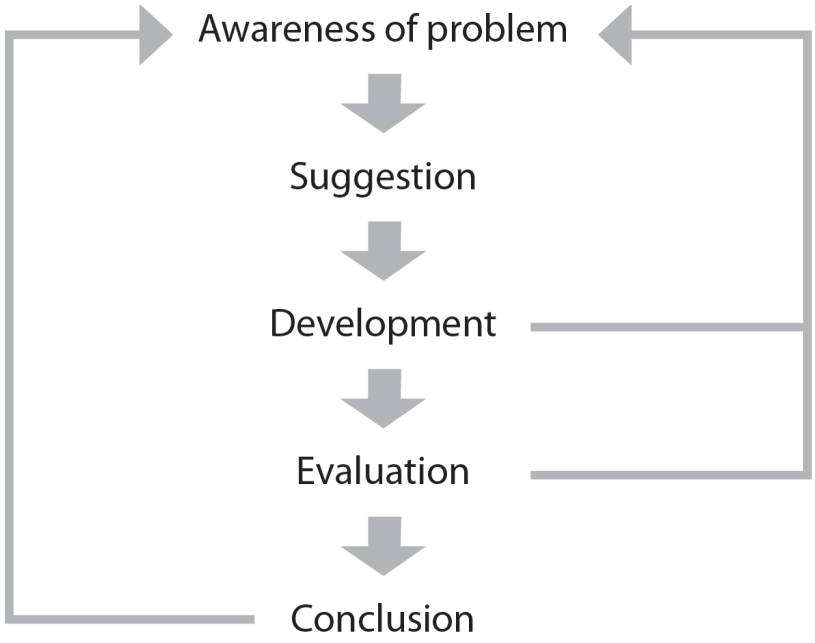


Figure 4.2 Design Cycle (Adapted from Takeda et al, 1990)

Similar to the framework of Takeda et al (1990) and Hevner (2007), Peffers et al (2008) further elaborated the process of generating design science knowledge, as shown in Figure 4.3. In comparison with the model of Design Cycle, awareness of the problem stage is broken down into two phases as problem identification and objectives of a solution. Stages of suggestion and development are merged into design and development. Evaluation stage is separated into demonstration and evaluation. The stage of conclusion is replaced by communication which connects to publications. Specifically, they added four possible approaches and solutions for research, as shown in circles in Fig 4.3.

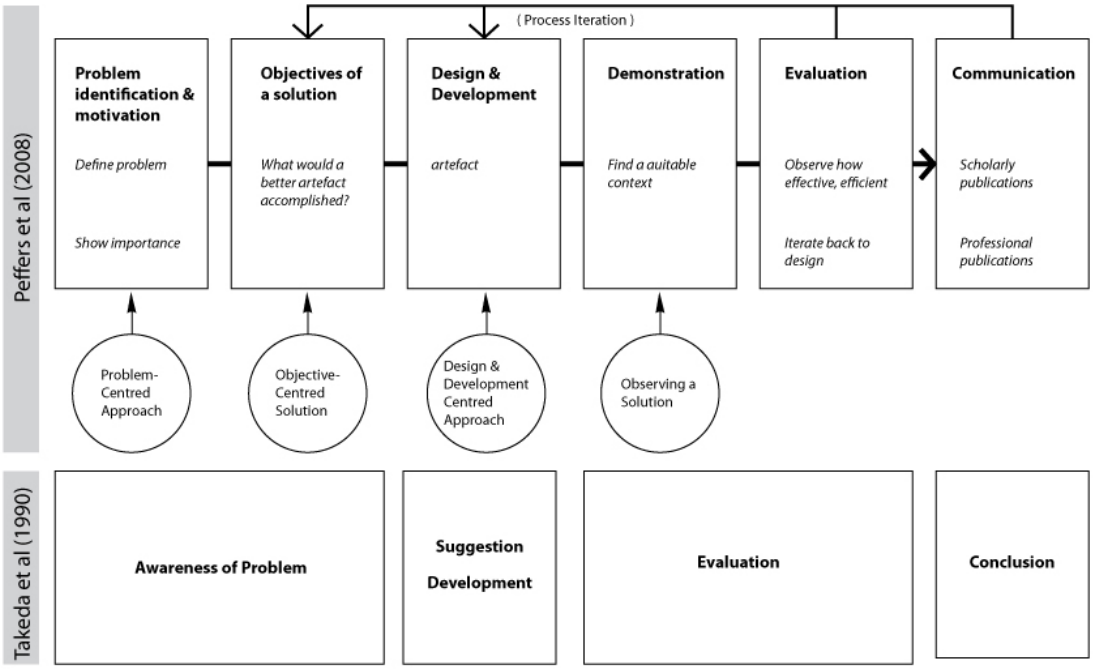


Figure 4.3 A Comparison of Design Science Research Process models

(Modified from Takeda et al, 1990; Peffers et al, 2008)

Vaishnavi and Kuechler (2004) adopted the design cycle of Takeda et al (1990) and modified it to a **Design Science Research Process Model** (Fig. 4.4) which involves knowledge flows. The design science research process model starts from *awareness of problem* in industries or reference fields and then makes a proposal. In the *suggestion* phase, a tentative design or prototype is integrated in the proposal as a creative step. In the *development* phase, the tentative design is embodied and accomplished by various techniques to construct the artefact. In the *evaluation* phase, the artefact is estimated through qualitative or quantitative methods based on the criteria made in the first phase (awareness of problem). Finally, results of the research contribute to knowledge which could support awareness of a new or interesting problem.

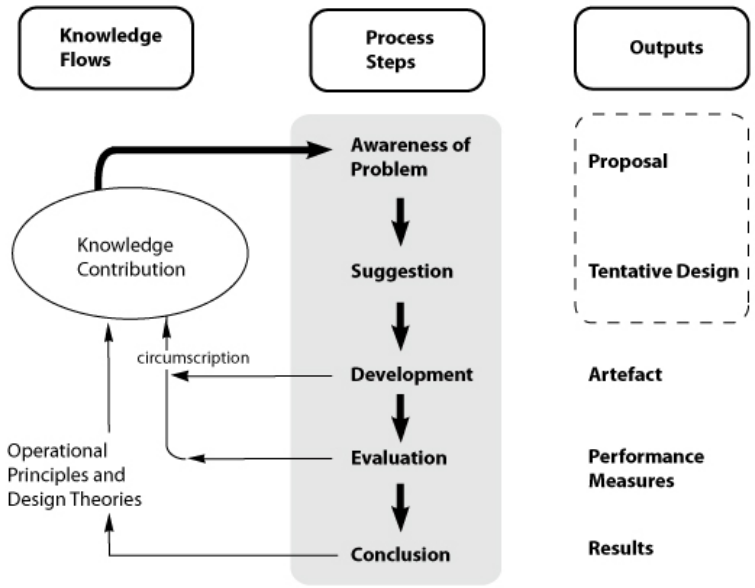


Figure 4.4 Design Science Research Process Model (Vaishnavi and Kuechler, 2004)

Design Science Research Cycles, as shown in Fig 4.5, suggested by Hevner (2007) stems from the Information System field and extends to be adapted in larger practical design science fields such as art, design, architecture and design-orientated domains. The *Relevance Cycle* is the connection between contextual environment and design science activities. Problems and opportunities in the environment can be identified and the evaluation of the research results can be defined. The *Rigor Cycle* bridges the results of design science research to the knowledge base which could be methods, theories, products or processes. The Design Cycle is performed by the circulation between developing and evaluating the artefacts or processes.

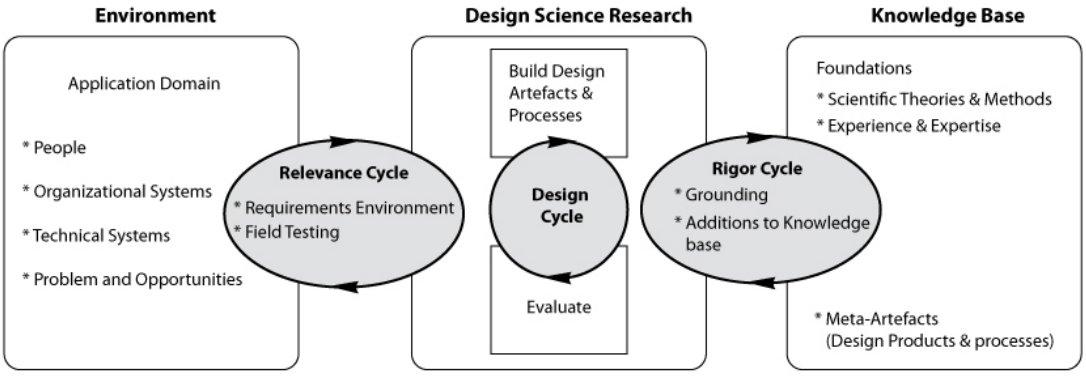


Figure 4.5 Design Research Cycles (adapted from Hevner, 2007)

Design research methodology (DSM), as shown in Figure 4.6, provides a framework including four stages to carry out practical design research. The stages are *research clarification* based on literature review, *descriptive study I* building on understanding of the current status by empirical data analysis, *prescriptive study* including developing a support or improving a situation, and finally *descriptive study II* consisting an evaluation of the support or improvement (Blessing and Chakrabarti, 2009). In the *Research Clarification* stage, problems or evidences which are laid down in the existing social environment are identified as well as assumptions can be made according to the findings from literature review in order to reach a goal. In the *Descriptive Study I* stage, an investigation is conducted to support better understanding of the existing situation in order to refine the task of research clarification into a detailed description. In the *Prescriptive Study* stage, a solution, such as a tool or any intended support, will be developed for the identified problem. Finally, in the *Descriptive Study II* stage, the applicability of the intended support (i.e. design tool) is evaluated to see whether it enhanced or assisted the problem stated. Also, the usability of the intended support is also tested.

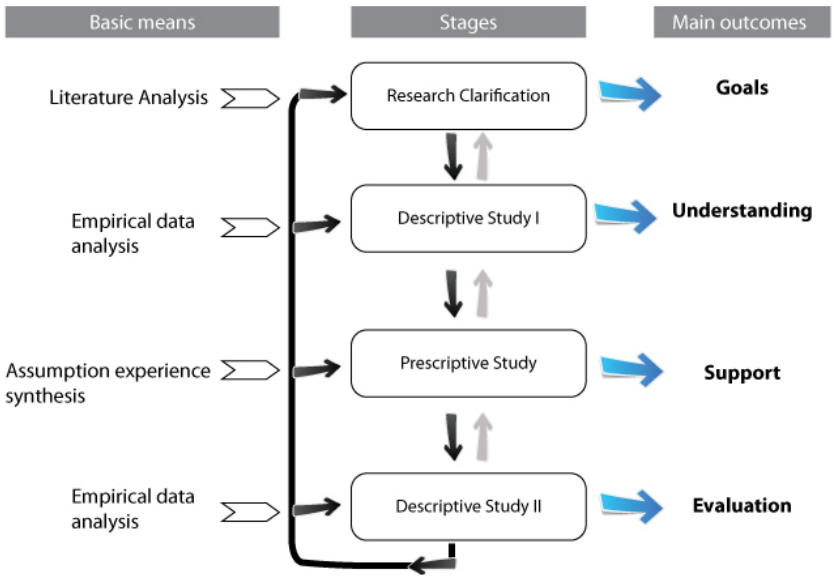


Figure 4.6 Design Research Methodology Framework (adapted from Blessing and Chakrabarti 2009)

4.3.1. Validity and Reliability

The quality of a research is based on its validity and reliability which leads to generalizability (Golafshani, 2003). Validity refers to the accuracy of the findings, specifically "the extent to which a test, questionnaire or other operationalization is really measuring what the researcher intends to measure" (Hall and Hall, 1996). Reliability stands for the consistency or stability of an approach over time adopted by different researchers many times to the same participants (Creswell, 2014; Punch, 2014; Hall and Hall, 1996). There are many debates of applying validity and reliability to qualitative research; however, Lincoln and Guba (1985) suggested alternative terms such as 'trustworthiness', to cover validity and reliability of qualitative research. They also suggested other correspondent assessing procedures which adapt criteria of quantitative research to qualitative research. Noble and Smith (2015) also suggested alternative terminologies for qualitative research in relation to terminologies for quantitative research. For example, 'validity' is in relation to 'truth value', where the research accurately shows participants' viewpoints or researchers recognise their personal experiences and perspectives that might cause bias. 'Reliability' is in relation to 'consistency', where researchers describe the research process from initial concept, through the development of the tools, and finally presenting findings.

4.3.2. Comparison of the Different Design Research Methodologies

Design research methodologies follow a main string from identifying problems, understanding the situation in order to develop an intended support as a solution, and then evaluating the supporting tool. Finally, the results of the research make a contribution to the knowledge which could be a new research background. The synthesis of aforementioned design methodologies were illustrated by the researcher in Figure 4.7.

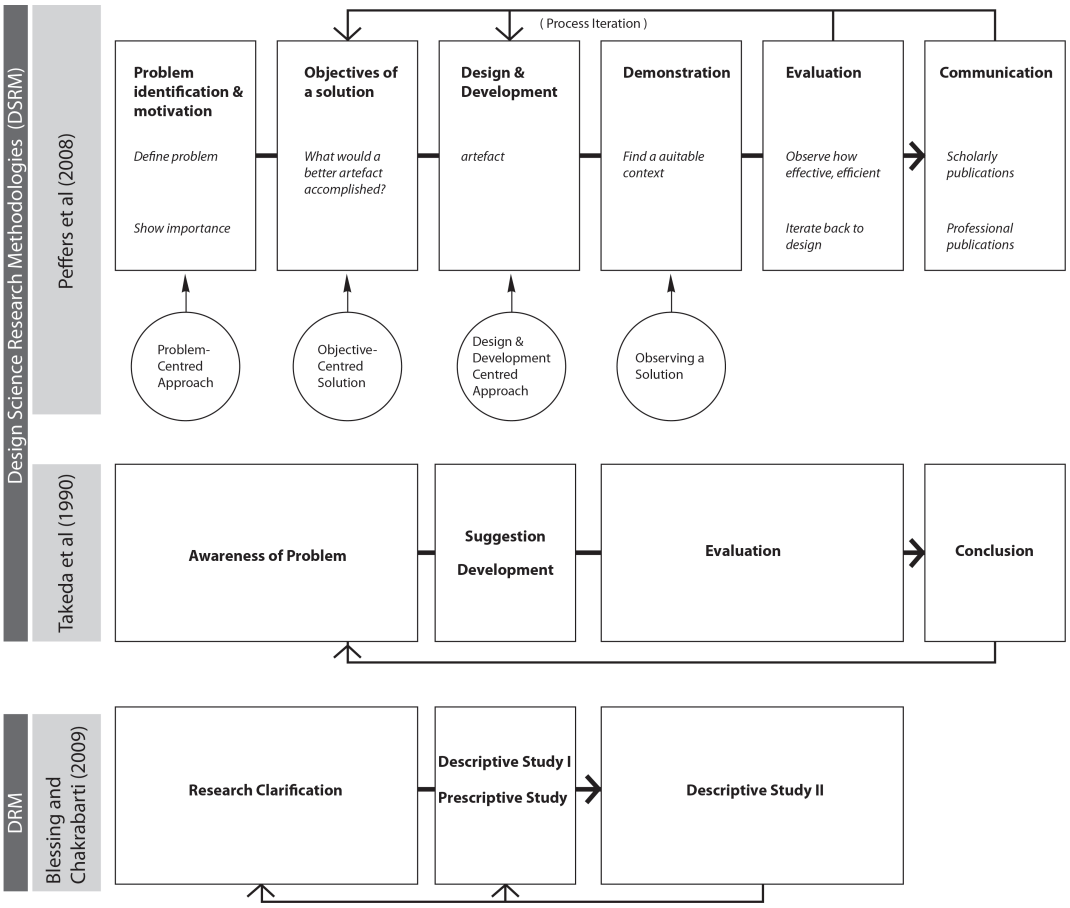


Figure 4.7 Design research methodologies

(Adapted from Blessing and Chakrabarti, 2009; Peffers et al, 2008; Takeda et al, 1990)

4.4 Selected Research Approaches and Methodology for this Research

The research described in this thesis is a combination of social research (see section 4.1) and design research (see section 4.2 and 4.3), because it involves humans in a real-world context and design as a means to improve a current situation. Both of related generic and design research approaches as well as design research methodologies were reviewed comprehensively in previous sections.

The research conducted in this thesis is 'research through design', a study of 'design praxeology' and falling in the realm of 'design exploration'. Table 4.1 summarized the adopted generic and design-related approaches in this research.

Table 4.1 Research approaches adopted in this research

	Reviewed research approaches	**Adopted research approaches**
Research purpose	Exploratory Descriptive Explanatory	Exploratory
Research strategies	Qualitative Quantitative mixed methods	Qualitative
	Deductive inductive	Inductive
Design research frameworks	Research into design Research through design Research for design	Research through design
	Design epistemology Design praxeology Design phenomenology	Design praxeology
	Design practice Design studies Design exploration	Design exploration
Design research and design practice map	User-centred design Participatory design Critical design Design +emotion	Design +emotion

The research purpose is considered as 'exploratory'. Cultural products get more and more consumers' attention these years under the flourishing creative industries. However, there has been few studies published regarding cultural products and this field can be further explored. In particular, this research is going to investigate human perception of cultural products that has not been explored yet.

The research strategy for this study is qualitative approach. Research methods such as focus group, interviews, and workshops are adopted. The questionnaires are used to investigate consumers' emotional experiences of Chinese cultural products. Data from the questionnaires is numeric and the numbers represent the degrees of how consumers feel. The data is subjective numbers for qualitative research rather than unshakable or objective numbers for quantitative research. These qualitative research methods inform an inductive approach where the phenomenon of Chinese cultural products will be revealed and interpreted.

The design research framework for this thesis falls in the category of 'research through design' and 'design praxeology', because the design process and tool of Chinese cultural products are the focus. This is a study of design practice which involves a design toolkit to assist designers in their design process. The aim of this research is to enhance the relationship between the users and products. Thus, it provides a set of card deck to assist designers in creating Chinese cultural products.

The design research methodologies follow a main string of clarifying the problem, suggesting or developing a suitable solution, and evaluating the solution. The Design Research Methodology (DRM) suggested a detailed framework of conducting design research. DRM provided not only design process steps but also many examples and guidance about how to implement the methods in design practice in order to create more successful products. In comparison to previous design methodologies, DRM emphasises more on products rather than art, crafts, architecture, or computer-aided design. Therefore, DRM was adopted in this thesis and was illustrated in the Figure 4.8 which shows the correspondence to generic research methodology as well as the outcome of this thesis.

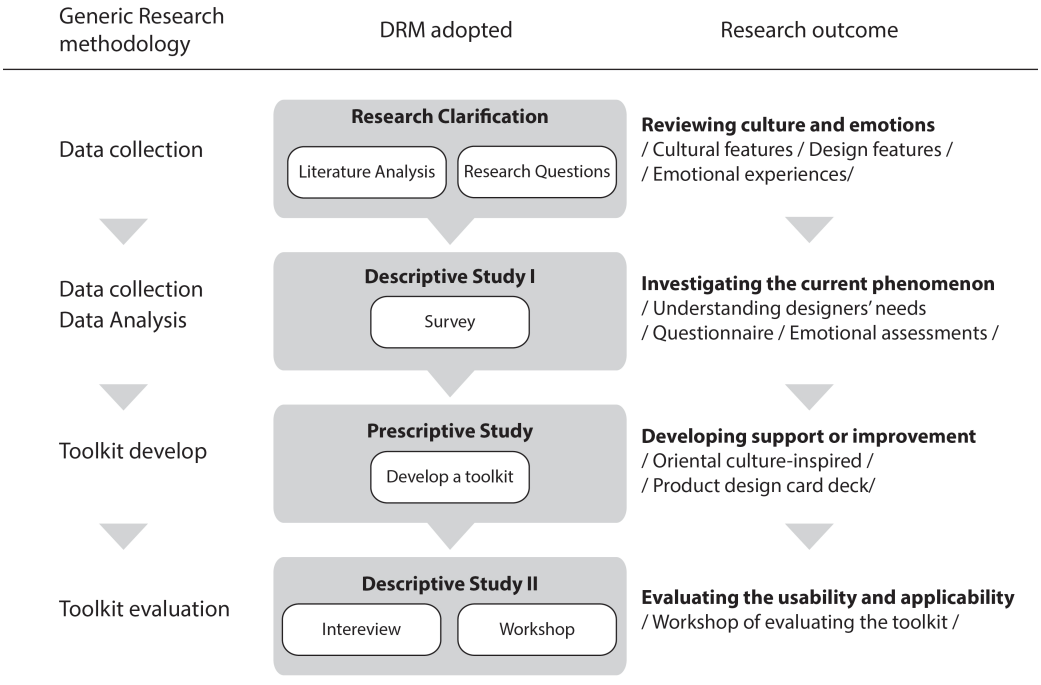


Figure 4.8 Adopted Design Research Methodology in this PhD research

4.5 Development of the Design Research Methodology (DRM)

In this section, we describe how Design Research Methodology was applied and how the research questions were incorporated into each stage and the methods applied to answer these questions. Research questions were chosen to investigate this issue because it is difficult to generate hypothesis based on existing knowledge while there are only few directly related research. The research questions can be answered by collecting and analysing qualitative or quantitative data in order to suggest solutions.

4.5.1. Research Clarification Stage

Data collection methods applied: literature review

Research Question 1: What are the cultural features that characterize a cultural product?

Literature review has been conducted to answer the first research question and mainly focuses on three aspects: background of cultural products, design solution for cultural products and human perception toward cultural products. Definitions of culture, cultural and creative industries (cultural product background) and cultural-product-related research (design solutions for cultural products) were reviewed; cultural products are defined and cultural features are concluded, followed by design techniques which are ways to present and to embed cultural features in modern products. Moreover, an overview of emotion is described, followed by the association between products and human emotions (human perception to cultural product). Then, emotional descriptors which are highlighted from psychology research and those which are chosen from emotion assessments are elaborated. Finally, potential emotion assessments were described. A literature review map of this research is shown in Figure 4.9.

The research gap identified was that human perception of cultural products has not been explored yet. Moreover, a design toolkit is proposed to help designers in their design process of cultural products.

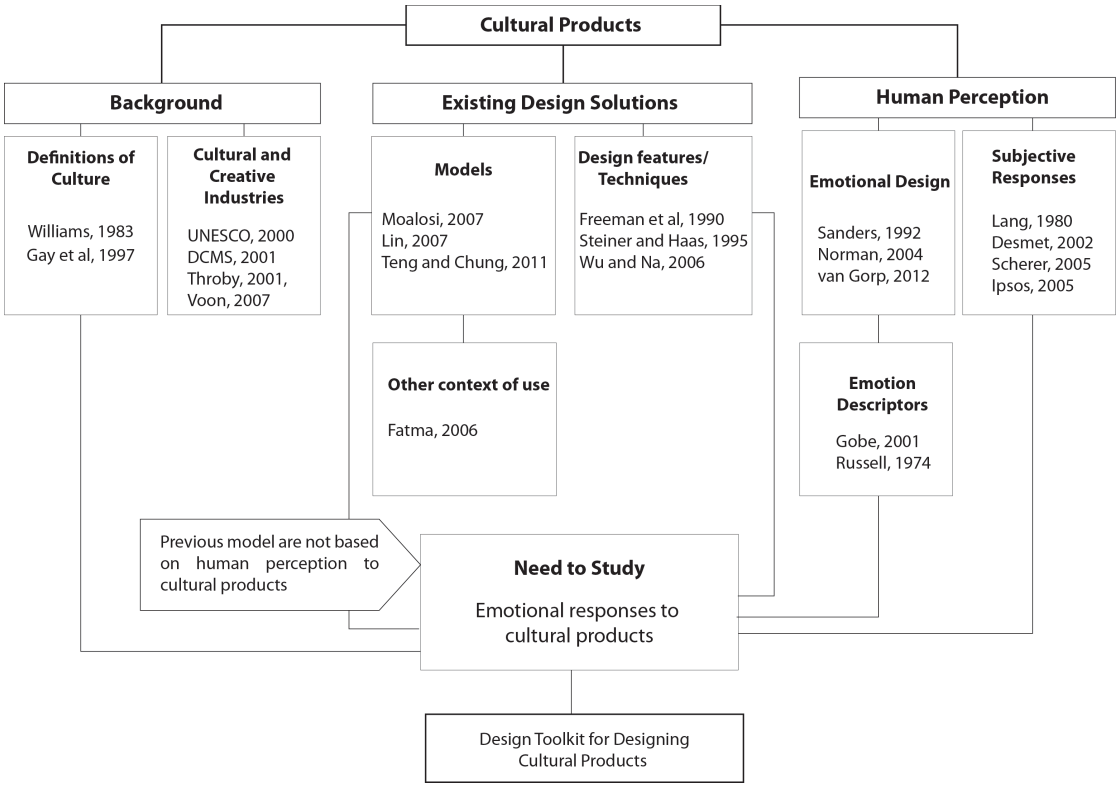


Figure 4.9 The literature review map of this research

4.5.2. Descriptive Study I

Most of the cultural products are only superficially decorated and the applications are repetitive (Li and Ho, 2009), such as a mug or a bag decorated with a famous painting. We can see many similar applications in a souvenir shop. These products are most likely failed to attract attention due to the repetition. Li and Ho (2009) claimed that designers play an important role to transfer abstract cultural meanings and values into actual and concrete products. Lin, Cheng, and Sun (2007) also placed emphasis on user experiences of cultural products, particularly on pleasurable experiences. Designers and researchers are trying to connect the cultural meanings and values with products as well as to consider the user emotional experiences. However, there has not been a study to investigate how consumers feel toward cultural products and how designers can enhance the emotional attachment of cultural products. Designers need supports of how cultural features affecting their

consumers' emotional experiences. Therefore, this research aim to provide a solution to meet the designers' needs and bridge the research gap. Firstly, a survey of how consumers feel toward cultural products is conducted.

Data collection methods applied: survey

Research Question 2: How do Eastern and Western populations emotionally appraise Chinese cultural products?

Comparison of Emotional Assessments

As one of the research objectives is to measure the human emotional responses to Chinese cultural products, self-report assessments are considered as the best approach to measure currently experienced emotions without intrusive equipment. Therefore, five current emotion assessments listed below (Table 4.2) allow participants to report their appraisal by a given emotion scales.

The common advantages of these self-report assessments are 1) low technical requirements, 2) non-intrusive, and 3) easy to apply. However, participants from different cultural backgrounds are included in the research; therefore, assessments which can be applied cross-culture are Self-assessment Manikin (Lang, 1980), PrEmo (Desmet, 2002) and Emoti* Scape (Ipsos, 2005).

Table 4.2 Comparison of emotional assessments

Assessments	**Self-assessment Manikin**	**PrEmo**	**Geneva emotional wheel**	**Emoti*Scape**	**Philip's questionnaire**
Authors	**Lang**	**Desmet**	**Scherer**	**Ipsos**	**Jordan**
Time	1980	2002	2005	2005	2000
Numbers of Emotional descriptors	2	14	20	40	14
Non-intrusive	v	v	v	v	v
Low technical requirement	v	v	v	v	v
Cross cultures	v	v	-	v	-
Pictorial scales	v	v	-	v	-

A survey was conducted via questionnaire to investigate emotional responses to Chinese cultural products. Saunders, Lewis and Thornhill (2012) distinguished the design of a survey questionnaire into *six types* which sit in two categories according to how it is administered and corresponding ways of being delivered and collected. One category is self-completed questionnaires which are administered by respondents and are collected via post or internet. The other one is interviewer-completed questionnaires which are undertaken by researchers via structured interview or telephone questionnaires. Self-completed questionnaire is one of the most popular data collecting methods, because a considerable data can be gathered in a relatively short time and low cost. Also it is more convenient and flexible for respondents to answer at a time and a place to suit them. Therefore, a self-completed questionnaire is adopted to collect emotion responses of participants from cultural products.

Research Question 3: What emotions could be expressed in reaction to certain Chinese cultural features?

In order to understand the current situation of human emotional responses to Chinese cultural products, a questionnaire was conducted with 140 participants of whom half have an Eastern cultural background and half have a Western cultural background. The questionnaire covers cultural background (Eastern or Western), age range, 40 representative images of Chinese cultural products and their original source, the instruction of SAM emotional scale, SAM emotional figure scale and 12 emotional descriptors (half of positive descriptor and half of negative descriptors). Hence, the results of this survey can answer research question 2 and 3.

In addition, the questionnaire for this research aimed to understand human perception from eastern and western participants. Therefore, it is a cross-cultural survey where a translated questionnaire is needed. Harkness, Vijver and Mohler (2003) suggested a procedure of translation for questionnaires which involved translation, review and adjudication, followed by pretesting and documentation. Also,

a non-verbal pictorial emotional assessment is applied in the questionnaire for a cross cultural survey.

4.5.3. Prescriptive Study

Toolkit development

A card deck for cultural products was developed as a support for idea generating in the design process. The card deck is categorized mainly by six positive emotional descriptors on the front side along with the potential target users' age. On the back side of the card, correlated cultural features are elaborated, adopted design principles are shown and examples of Chinese cultural products in the market are listed as a reference.

4.5.4. Descriptive Study II

Evaluation methods: interview + workshop

Research question 4: What information should a cultural product toolkit have for designers?

In the final stage, workshops were conducted with designers to get feedback in order to improve the toolkit, and design expert interviews were conducted to evaluate the usability of the toolkit.

Experts' Semi-structure Interviews

The purpose of an expert interview is to gather factual and professional information of a problem with a specific issue (Kolb, 2008). Semi-structured interview is a flexible qualitative analysis which allows the interviewer to add or omit questions depending on the appropriateness during an interview (Robson, 2002), and also it allows respondents to elaborate their answers in extent (Gray, 2014). This interview is

adopted to gather insight from senior researchers or designers, and evaluation of the card deck.

Workshop

'Workshop' is a common method to test and evaluate a design inspirational tool (Lucero and Arrasvuori, 2013; Lockton, Harrison and Stanton, 2013; Alves and Roque, 2011; Kultima *et al.*, 2008) . It is also a practical research method which involves generating ideas, brainstorming in an ideation session (Lockton, 2013). Workshops for this research were conducted by six designers in total: three designers from eastern cultural background, and three from western cultural background to evaluate the card deck.

Expert's Group Interviews

The purpose of an experts' interview is to gather factual and professional information of a problem with a specific issue (Kolb, 2008). Group interview is when interviewees are more than one person. This is also called a focus group. A distinguishing trait of a focus group is its interesting data collection by interaction within participants where their opinions, perceptions and reasons can be more easily accessible (Punch, 2014). Interview can be distinguished by its degree of structure and standardization; the degree of structure refers to an identical form and order in interviews, while the degree of standardization refers to how open are the answers that are expected (David and Sutton, 2011). A Semi-structured interview is a flexible qualitative analysis which allows the interviewer to add or omit questions depending on the appropriateness during an interview (Robson, 2002), and also it allows respondents to elaborate their answers in extent (Gray, 2014). The semi-structured group interview has been adopted to gather insight from senior researchers or designers, and for evaluation of the card deck.

4.5.5. Validity and reliability of the methods

The validity of qualitative research depands on the reflection of the truth valus. The validity of this research is that the researcher will describe the bias she might have due to her personal perspective and will accurately present the participants' viewpoints and feedback. Additionally, the researcher need to acknowledge biases in sampling as well in order to ensure the findings accurately reflecting the data. The reliability of qualitative research is to keep the consistency of the procedure. The reliability of this research is to cearly describe the research process, the collected data, the development of the toolkit, and the feedback from the perticipatns.

Summary

In this chapter, research purpose and strategies of this research were addressed. This research interpreted the social and cultural issues by qualitative methods and then induce a potential solution to a real world problem. The Design Research Methodology was followed in order to investigate this research issue. Qualitative research methods were adopted to answer the research questions (Table 4.3). Then, the findings led to the creation of a card deck for new product development. In chapter five, the executive research process will be discussed in detail.

Table 4.3 A framework of this research according to DRM

DRM	Studies	methods
Research clarification	Understanding cultural products (Chapter 2)	Literature review
	Understanding information process (Chapter 3)	
	Understanding human emotions (Chapter 3)	
	Design research methodologies (Chapter 4)	
Descriptive study I	Exploring human emotional responses to cultural products (Chapter 5)	Questionnaire
Prescriptive study	Developing the card deck (Chapter 6)	
Descriptive study II	Evaluating the toolkit (Chapter 7)	Workshop Expert interview

5

EMOTIONAL APPRAISAL OF CHINESE CULTURAL PRODUCTS (Descriptive Study I)

In the research classification stage, described in chapter 2 and chapter 3 the literature review of culture and human emotions were introduced., The measurement of human emotional responses to cultural products was performed and the result are shown in chapter 5. In the stage of descriptive study I, a questionnaire was conducted to investigate how cultural features and design features affect human emotional responses to a cultural product. Therefore, the development of the questionnaire is introduced in section 5.1, followed by the selection of emotional descriptors in section 5.2 and selection of images of cultural products in section 5.3. Finally, the results of the questionnaire are displayed in section 5.4 and 5.5.

5.1 The Design of the Questionnaire

The design of the questionnaire aimed to discover human perception of cultural products. The images of cultural products and their original source were presented in questions and SAM emotional assessment (section 3.6.1) was adopted to test how much people like the products. Additionally, twelve emotional descriptors were provided to further understand different pleasant emotions aroused.

The questionnaire included basic information of the participants -- such as cultural backgrounds (Eastern or Western), range of the age, genders – as well as the instruction of SAM emotional scale, followed by 40 representative images of cultural products and their original source, SAM emotional figured scale, and 12 emotional descriptors (refer to section 5.2).

Forty representative images of cultural products were selected from one hundred and eleven into forty images of cultural products for the questionnaire (section 5.3). Self-assessment Manikin was adopted to measure pleasure and arousal from cultural products. A framework of the questionnaire was presented in Figure 5.1 and an example of the questionnaire was shown in Figure 5.4. Images of original cultural features were provided next to the images of the cultural products to show their original source.

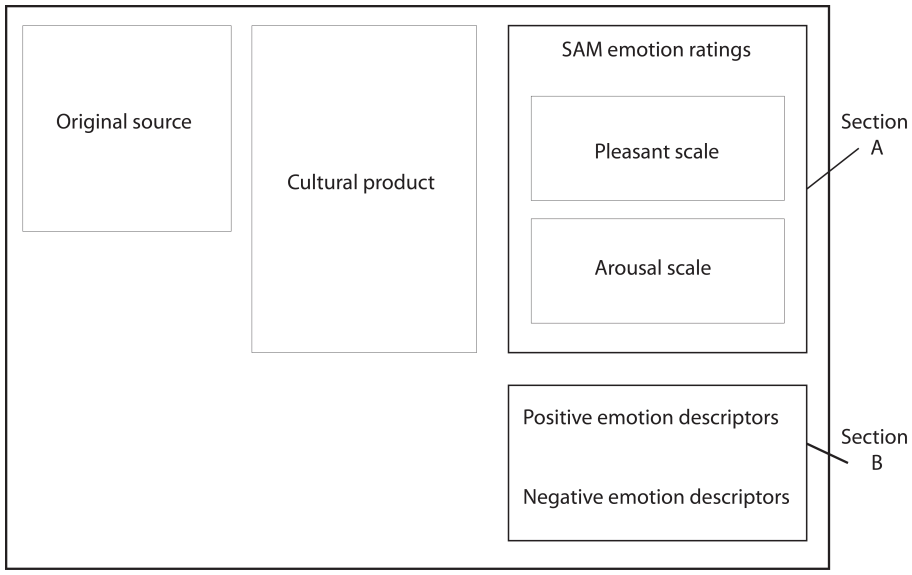


Figure 5.1 The Framework of the questionnaire

Section A: Emotional response by SAM

As aforementioned, SAM was adopted to measure emotional experience in many studies and was evaluated as a reliable assessment; therefore, SAM was also adopted in the questionnaire to examine general perception of how pleasant and arousal felt on cultural products from Eastern and Western participants. Two dimensions of SAM ratings of pleasantness and arousal were illustrated by five figures each of which can be selected quicker by intuition without thinking too much of other emotions.

Section B: Other feelings

Furthermore, except from the first impression to select the degree of pleasure and arousal, other options of feelings were provided. These emotional descriptors were mainly divided into twelve descriptors within two parts which are positive and negative. In the following paragraph, the way of selecting emotional descriptors, specifically for cultural products, was described.

The questionnaire was developed that consisted of primitive cultural features, cultural products which are inspired from the cultural feature, SAM ratings of pleasure and arousal and emotional descriptors. Also, the copyright in all images used in this questionnaire and in this thesis have been used under statutory exceptions for educational purposes and belong to their respective owners.

5.2 The Selection of Descriptors for Emotional Experiences

The basic emotional experiences in the environment stated by Mehrabian and Russell (1974) were shown in pairs which are happy /unhappy, pleased/annoyed, satisfied/unsatisfied, contented/melancholic, hopeful/despairing, relaxed/bored in pleasure aspect; stimulated/relaxed, excited/calm, frenzied/sluggish, jittery/dull, wide-awake/sleepy, and aroused/unaroused in arousal aspect. Also, pleasure-displeasure and arousal-sleep aspects can be mapping into a two-dimensional space in a circular structure (Russell, 1983). Furthermore, some emotion measurements are developed based on Russell's pleasure-arousal two-dimensional space (Ipsos,

2005; Scherer, 2005; Desmet, 2002). Due to previous studies, descriptors of emotional experiences used in Product Emotional Measurement Instrument (Desmet, 2002), Geneva emotion wheel (Scherer, 2005) and Emoti*Scape (Ipsos, 2005) were summarized and mapped to Russell's 'pleasure and arousal' two-dimension space in the Figure 5.2.

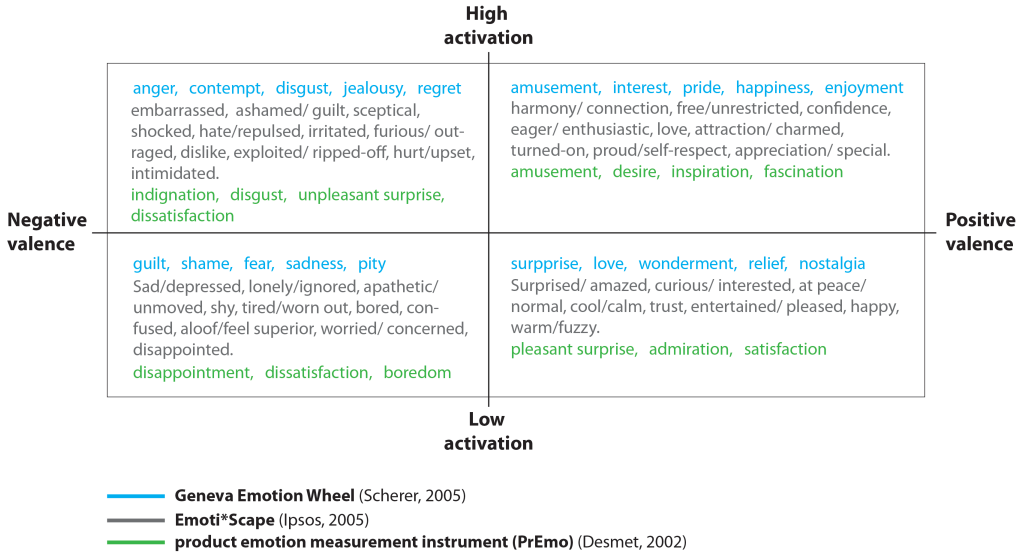


Figure 5.2 Descriptors of emotional experiences distributed in two-dimensional space

In the study of Bradley et al (2001), twenty-four emotional descriptors were selected for testing participants' emotional responses from selected pictures. These twenty-four descriptors are the following: angry, afraid, bored, sad, pity, anxious, irritated, disgusted, impatient, unhappy, confused, embarrassed, happy, hungry, loving, sexy, excited, romantic, nurturant, satisfied, comfortable, free, playful, and amused. These descriptors were also adopted in a study of investigating emotion and attention in an international affective picture system (Bradley and Lang, 2007).

Furthermore, some hidden emotional descriptors corresponding to a brand are explored by participants within a brainstorming exercise and were collected to give an in depth insight of the brand. Some descriptors are listed as: cool, fun, humorous, style, attracted, self-expression, luxurious, romantic, amused, nostalgia, bored, angry, confused, anxious, and cheap (Gobe, 2001). Hence, the descriptors of emotional experience that are associated with the environment, product appearance, user

experience, and brand or trade market have been stated in variety of psychological and design-related studies, which were listed in Table 5.1.

Table 5.1 Frequency of descriptors of emotional experiences

Emotion Descriptors \ Authors / Year / Assessments	Mehrabian and Russell 1974 Basic emotion descriptors of environment	Bradley et al 2001 Affective picture system	Jordan 2002 Pleasure feelingd o f product - using experience	Desmet 2002 PrEmo	Scherer 2005 Geneva Emotion Wheel	Ipsos ASI 2005 Emoti*Scape	Times
admiration				*	*		2
amused/ amusement		*		*	*		3
appreciation/ special						*	1
aroused	*						1
at peace/normal						*	1
attached			*				1
attraction/ charmed						*	1
comfortable		*					1
compassion					*		1
confidence			*			*	2
contented/ contentment	*				*		2
cool/calm						*	1
curious/ interested						*	1
desire/ eager/ enthusiastic			*	*		*	3
enjoy			*				1
entertained/pleased			*			*	2
excited	*	*	*				3
fascination				*			1
free /unrestricted/ sense of freedom		*	*			*	3
gratitude						*	1
happy / joy	*	*			*	*	4
harmony/connection						*	1
hopeful	*						1
hungry		*					1
inspiration/inspired/encouraged				*		*	2
Interest					*		1
jealous/wishful						*	1
looking after the product			*				1
love/ loving		*			*	*	3
miss			*				1
nurturant		*					1
playful		*					1
pleasant / pleased / pleasure	*			*	*		3
pride / proud / self-respect			*		*	*	3
relaxed / relief / relieved	*		*		*	*	4
rely			*				1
romantic		*					1
satisfaction / satisfied	*	*	*	*			4
sexy		*					1
stimulated	*						1
surprise / amazed				*			1
trust						*	1
turned-on						*	1
warm/fuzzy						*	1
wide-awake	*						1

Figure 5.3 was illustrated to explain that the descriptors of emotional experience for this study were mainly selected from psychological research, emotion assessments as well as emotional branding field. From the aspect of psychological research and emotional assessments, emotional descriptors are provided by six studies including Mehrabian and Russell (1974), Jordan (2002), Bradley et al (2001), Desmet (2002), Scherer (2005), and Ipsos ASI (2005), as shown in Table 5.1. More frequent (more than three out of six) descriptors of these studies are amused, desire, free, happy (pleasant), love, pride and satisfaction (Table 5.1). Among these descriptors, amused

is considered more suitable by the researcher because it describes more specifically about how users feel about products. Other descriptors -- such as desire, free, love, pride, or satisfaction -- tend to be a little vague to describe a product experience. Taking 'desire' for example, why users desire a product and what the factor is to make the product desirable. On the contrary, 'amused' can more specifically describe that the product makes users feel funny. Additionally, happy (pleasant) was already presented in section A of the questionnaire and, therefore, it was excluded in section B. From a practical marketing perspective, an emotional meaning of a brand affects consumers' attachment to their products; therefore, descriptors from emotional branding keep of the emotional descriptors up to dates. Emotional experience -- such as humorous, self-expression, and luxurious -- from emotional branding (Gobe, 2001) were considered appropriate to describe potential emotions from cultural products. Therefore, the six positive emotional descriptors used are attractive and amused from psychology and assessments research and humorous, self-expression, luxurious and nostalgia from emotional branding (Figure 5.3).

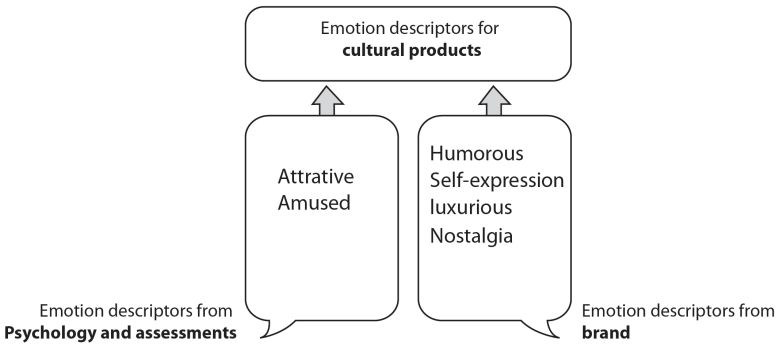


Figure 5.3 Selection sources of emotional descriptors for cultural products for this research

On the other hand, negative emotional descriptors were selected as bored (Mehrabian and Russell, 1974; Bradley et al, 2001; Desmet, 2002), angry (Bradley et al, 2001), confused (Ipsos, 2005), anxious, cheap, and pessimistic (Gobe, 2001). In this study, positive emotions were focused, because the results will contribute to a card deck which was designed to enhance positive feedback from the consumers.

The selected emotional descriptors from psychology literature and experiential responses from emotional branding strategy are suggested as examples of users' emotions, aesthetic judgement, and experiential responses for Chinese cultural products. Both positive and negative emotional experiences of objects are shown in Table 5.2 and are adopted in the questionnaire.

Table 5.2 Experience of objects for this research

Experiential responses selected for this research			
Positive	Attractive	Humorous	Amused
	Self-expression	Luxurious	Nostalgia
Negative	Bored	Angry	Confused
	Anxious	Cheap	Pessimistic

Definitions of the emotional experiential descriptors are mainly from Merriam-Webster dictionary, Cambridge dictionary and Oxford dictionary as shown in Table 5.3. The definitions applied on the research were slightly modified to adapt to the context of user experience.

Table 5.3 Definitions of emotional experiential descriptors

Attractive	
Merriam-Webster	having a pleasing appearance
Cambridge dictionary	causing interest or pleasure
Oxford dictionary	Pleasing or appealing to the senses
Definition for the research	The product has a pleasing appearance to the senses.

Humorous	
Merriam-Webster	indicating or expressive of a sense of humour
Cambridge dictionary	funny, or making you laugh
Oxford dictionary	Causing laughter and amusement; comic
Definition for the research	A product can make you laugh or deliver a sense of humour and fun.

Continued next page

Amused	
Merriam-Webster	to get the attention of (someone) in a pleasant way as time passes
Cambridge dictionary	showing that you think something is funny: to keep someone interested and help them to have an enjoyable time:
Oxford dictionary	Cause (someone) to find something funny: Provide interesting and enjoyable occupation for (someone); entertain:
Definition for the research	Provide interesting and enjoyable occupation for target users.

Self-expression	
Merriam-Webster	the expression of your thoughts or feelings especially through artistic activities
Cambridge dictionary	expression of your personality, emotions, or ideas, especially through art, music, or acting:
Oxford dictionary	The expression of one's feelings, thoughts, or ideas, especially in writing, art, music, or dance
Definition for the research	The expression of target users' personality, feelings, emotions, or thoughts through a product.

Luxurious	
Merriam-Webster	feeling or showing a desire for expensive things richly appealing
Cambridge dictionary	very comfortable and expensive:
Oxford dictionary	Extremely comfortable or elegant, especially when involving great expense:
Definition for the research	Make your target users feeling a desire for expensive things with richly appealing and extremely elegant, especially when involving great expense.

Nostalgia	
Merriam-Webster	Pleasure and sadness that is caused by remembering something from the past and wishing that you could experience it again.
Cambridge dictionary	a feeling of pleasure and also slight sadness when you think about things that happened in the past:
Oxford dictionary	A sentimental longing or wistful affection for a period in the past
Definition for the research	A sentimental longing such as pleasure and sadness that is caused by remembering something from the past and wishing that you could experience it again.

5.3 The Selection of Images of Cultural Products

Images of cultural products were collected as many diverse design features as possible. One-hundred and eleven cultural product images were collected electronically from online sources such as Google image search, design award competition archives, museum websites, and research papers. The image collecting was completed during October 2011 to May 2013 using keywords in Google Image Search such as 'calligraphy and Chinese cultural products', 'paper cutting and Chinese cultural products', or 'utensil and Chinese cultural products' in both Chinese and English. The first 1000 images of Google Image Search were reviewed by the researcher to select the images which were relevant to the research. Also the awarded products from iF design competition, Red Dot design competition, Taiwan goods, and International Cultural and Creative Industry Expo design competition were reviewed and relevant products were selected.

Afterwards, the images were refined by the researcher. When products use the same design method for the same cultural feature, one of these similar products will be chosen as an example. For instance, various images of traditional Chinese paintings or calligraphy are superficially printed on mugs and one mug will be selected among all to be an example of this category of cultural features. After eliminating the replicated images, there were 40 examples left and thus were chosen to present various types of design features of applying cultural features on products. The forty examples were then divided using the categories discussed in section 2.3; the images were grouped as 1) six samples of applying handwriting and painting, 2) six samples of applying printing and paper cutting, 3) seven samples of applying origami, 4) seven samples of applying utensils or objects, 5) five samples of applying customs, 6) two samples of applying food, 7) two samples of applying architecture, 8) two samples of applying religion, and 9) three samples of applying nature.

In total, 40 examples were chosen out of the 111 cultural product images that were originally collected. However, limitations of this selection were that the selected images of cultural products could not represent all cultural products, yet 40

examples were considered by the researcher to be adequate to begin to investigate emotional responses from individuals because of the precedent set by previous research. Studies as shown in Table 5.4, which applied pictorial array to measure emotions or perception, presented their pictures ranging from 6 to 60 items to the participants. The first three studies in the table, those by Desmet (2004), Desmet, Porcelijn and Dijk (2007), and Kim et al (2012), mainly focused on measuring emotions aroused by products, whereas the studies by Bradley and Lang (1994) (2007) and Bradley et al (2001) mainly utilised pictures to define emotions. The first three studies listed in Table 5.4 are considered most relevant to this thesis because their focus was on emotional responses from products. The numbers of products used in the studies ranged from 6 to 10 items. In this thesis, however, 10 items for 9 categories of cultural products were not considered sufficient to present the variety of cultural products. Therefore, numbers of products used for each category ranged from 2 to 7 items.

Table 5.4 Number of pictures and participants used in studies which measure emotions

Authors (year)	Products / Pictures	Numbers of pictures	Participants
Desmet (2004)	Cars	6	68
Desmet, Porcelijn and Dijk (2007)	Mobile phones	8	35
Kim et al (2012)	vacuum cleaners	10	12
Bradley and Lang (1994)	International affective pictures	21	78
Bradley and Lang (2007)		60	100
Bradley *et al* (2001)		72	95

The number of product images which grouped into correlated cultural features was presented in Table 5.5. The reference of the product images can be found in appendix C.

Table 5.5 Distribution of Chinese cultural products in each category of cultural features

Category	Cultural features	Numbers of Sample tested	Product image serial No.
Art and artistic activities	1. handwriting and painting	6	1, 2, 3, 4, 5, 6
	2. printing and paper cutting	6	7, 8, 9, 10,11,12
	3. origami	7	13, 14, 15, 16, 17, 18, 19
Artefacts	4. utensils and objects	7	20, 21, 22, 23, 24, 25, 26
Customs	5. customs	5	27, 28, 29, 30, 31
Food	6. food	2	32, 33
Architecture	7. architecture	2	34, 35
Religion	8. religion	2	36, 37
Nature	9. nature	3	38, 39, 40
	Total	40	

An example of the questionnaire which was presented to the participants is shown in Figure 5.4. An image of a cultural product was presented in the middle of the question, while the left hand side is an image of its original cultural inspiration and on the right hand side is the SAM evaluation scale, and additional emotional descriptors.

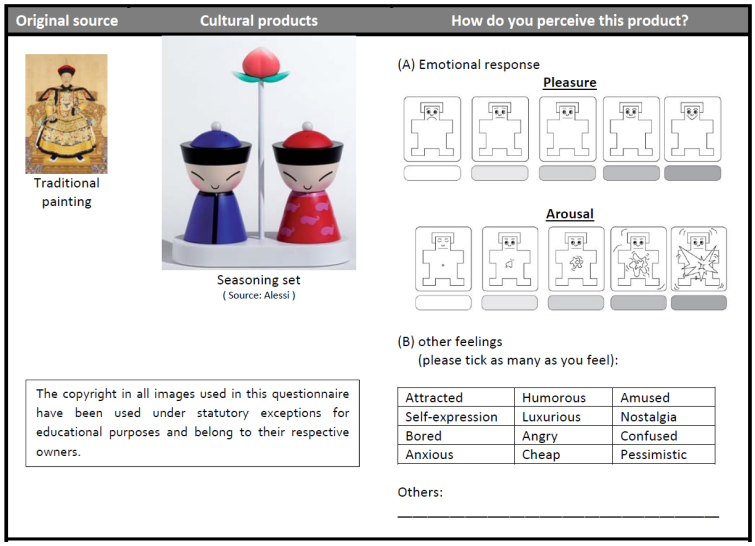


Figure 5.4 One of the questions in the questionnaire

This questionnaire was conducted with 140 participants whom 70 participants were from an Eastern cultural background (including people from China, Japan, Thailand, Taiwan, Indonesia, and Korea) and 70 participants from Western cultural background

(including people from European countries, United States, Brazil and Mexico). The participants were recruited mainly in Taiwan and the United Kingdom. The questionnaires were spread by both emails and hard copies to people randomly and the recruitment tried to cover different ages.

In total, seventy Eastern (n=70) and seventy Western (n=70) participants were included, and the participants' age was mainly between age 20-39 (Figure 5.5); Eastern population of age 20-39 is fifty-seven, and Western population of age 20-39 is fifty-nine. In the Eastern group, twenty-nine males and forty-one females participated; in the Western group, thirty-four males and thirty-six females participated.

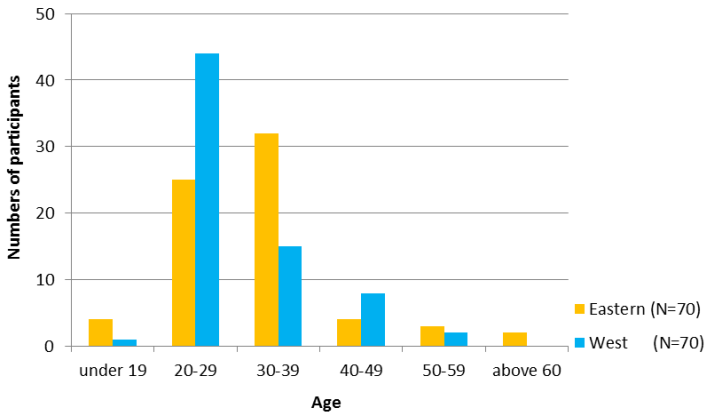


Figure 5.5 Age distribution of Eastern and Western participants

5.4 Results of the Questionnaire

The questionnaire was conducted to answer research question two and three:

Q2: How do Eastern and Western populations emotionally appraise cultural products?

Q3: What emotions could be expressed in reaction to certain cultural features?

In the following paragraphs, the answers to the questions will be displayed and the comparison between Eastern and Western participants will be shown.

5.4.1. Results of Pleasantness and Arousal from SAM

SAM is an iconic image array which provides five values from happy to unhappy. The figure in the middle between happy and unhappy is defined as neutral when participants feel neither happy nor unhappy (Bradley and Lang, 2007). In this thesis, figures are defined as a 5-points scale where figure of happy as 5 points, figure of slightly happy as 4 points, figure of neutral as 3 points, figure of slightly unhappy as 2 points and figure of unhappy as 1 point. Thus, this questionnaire is measured on nominal (categorical) scales.

The focus of this questionnaire is mainly on how people like Chinese cultural products and the results of pleasantness are displayed. Frequency distribution is carried out to assess how the emotional feedback distributed in 5-points. The measures of assessing frequency distribution are normally mode, the mean, and the median (Field, 2013). The mode indicates the most frequent points occurred in the data. The mean is the average of the points. The median means the middle score of the data set, which is also the centre of a distribution. As shown in Table 5.6, result of the mean of pleasantness from both groups are higher than the neutral 3 points which suggested that both groups feel pleasant about Chinese cultural products. The median of the result is the same from both groups. The mode shows that more population in the Western groups feels pleasant about Chinese cultural products.

Table 5.6 The descriptive statistics of pleasure from Easterners and Westerners

	Pleasure			
	Descriptive statistics			
	Mean	Median	Mode	N
Easterners	3.4	3	3	70
Westerns	3.3	3	4	70

The study of Bradley and Lang (2007) assessed emotional feedback of pictures from the International Affective Picture System (IAPS) by 9-points SAM scale. Converting 5-points scale to 9-points scale is necessary to compare the results of this thesis with

Bradley and Lang's study. A transformation from 5-point scale to 9-point scale is suggested by IBM Support (2010). As shown in Table 5.7, the mean 3.4 of Easterners was converted to 5.8 and the mean of 3.3 of Westerners was converted to 5.6. As a result, 5.8 and 5.6 are both more than neutral (from 4.8 to 5.1) but less than pleasant (from 6.9 to 7.1). Therefore, in comparison to their study, the result of this thesis can be explained that emotional appraisal from both groups is plotted in between 'pleasant' and 'neutral'. That is to say, both populations felt slightly pleasant about Chinese cultural products.

Table 5.7 Result comparison with Bradley and Lang's study

	Descriptive statistics Mean pleasure		
	Pleasant	Neutral	Unpleasant
Bradley and Lang (2007)	**6.9-7.1**	**4.8-5.1**	2.6-3.4
This thesis	Easterners: **5.8** out of 9 (3.4 out of 5) Westerners: **5.6** out of 9 (3.3 out of 5)		

Bar charts can display the means of the points across different groups. Additionally, an error bar plot, where a bar presents the mean and a line represents the precision of the estimate standard deviation of the mean instead, can be used to compare different groups (Field, 2013). In Figure 5.6, the mean of Eastern group is 3.4 and Standard deviation (SD) is 1.1 as well as the mean of western group is 3.3 and SD is 1.2. It is clear that the lines were spread out very similar within large overlap including the mean value between groups. It indicates that the range of pleasure perceived by both groups is very similar. Pleasantness perceived of Western group is slightly lower than Eastern group and the spread of pleasantness scores of Western group is slightly more than Eastern group. Overall, both groups felt very similar about Chinese cultural products.

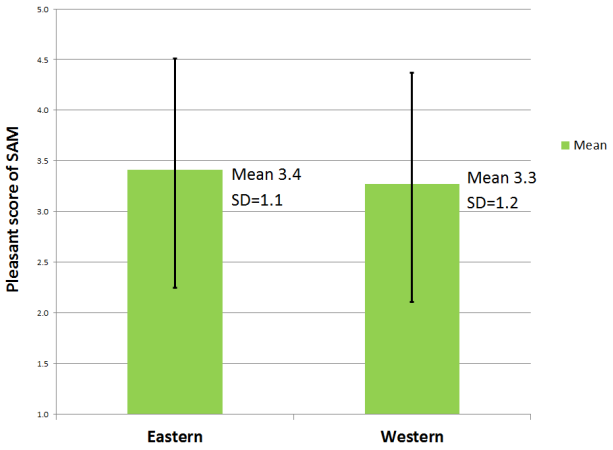


Figure 5.6 Mean score error bar for Eastern (n=70) and Western (n=70) groups
Standard deviation (SD): SD ±1.1 for Eastern group, SD ±1.2 for Western group

Since both groups felt pleasant across all Chinese cultural products, which products are perceived significantly difference among all products between Eastern and Western groups are concerned. Field (2003) suggested Mann-Whitney test can be conducted when comparing different groups with different entities. As a result, Mann-Whitney test shows non-significant for most of the Chinese cultural products between Eastern and Western groups, except products shown in Figure5.7.

Serial No.	**P5**	**P12**	**P16**	**P22**
Product	**Necklace**	**Tea bag**	**Speaker**	**Pencil sharpener**
Image				
Serial No.	**P23**	**P27**	**P32**	**P33**
Product	**Cell phone**	**Seasoning set**	**USB flash**	**Seasoning set**
Image				

Figure 5.7 The products which show significant difference for the pleasant scores from Eastern and Western groups

These highlighted products are: a necklace (P5) of abstract brushes of Chinese calligraphy, a tea bag (P12) printed with contents of a Chinese tea Bible, an origami shape of speaker (P16), products (P22 & P23) which are coated with traditional patterns of utensils, a kitchenware (P27) made by a reduction ratio of figure with traditional fashion, and products with food shapes such as memory stick (P32), and kitchenware (P33).

The *P*-value of these products are less than.05, which shows the significant difference, such as P5 (p=.009), P12 (p=.025), P16 (p=.020), P22 (p=.032), P23 (p=.016), P27 (p=.019), P32 (p=.019), and P33 (p=.005) (see appendix B1). Eastern group showed much more appreciation than Western groups among most of the products, except product P5. The result shows that the mean rank of P5 from Westerners is 79.15, which is higher than mean rank of 61.85 from Easterners. The result presents that pleasantness perceived from both groups is very similar, except 8 products are perceived significantly different. Therefore, when designing Chinese cultural products for Eastern population, cultural features of movable type style printing, origami shapes, patterns of traditional utensils, and food shapes are suggested. Alternatively, abstracts of traditional art are recommended for Western groups.

Furthermore, the pleasantness of products perceived regarding categories of cultural features is focused and the result is shown in Figure 5.8 and 5.9 present. Chinese cultural products inspired from origami and food are perceived most 'pleasant' for Easterners (Fig. 5.8), while products inspired from origami and architecture are perceived most 'pleasant' for Westerners (Fig. 5.9). However, products inspired from religion are perceived as the lowest pleasant among all cultural features from both groups.

For Eastern group, the pleasant and arousal scores are almost overlap in every category, but for Western group, arousal scores were lower than pleasant scores. This result indicates that Eastern group felt more excited when perceiving Chinese cultural products than Western group. In the following analysis, the focus is on the

pleasant scores to further explore how different the pleasantness perceived from both groups.

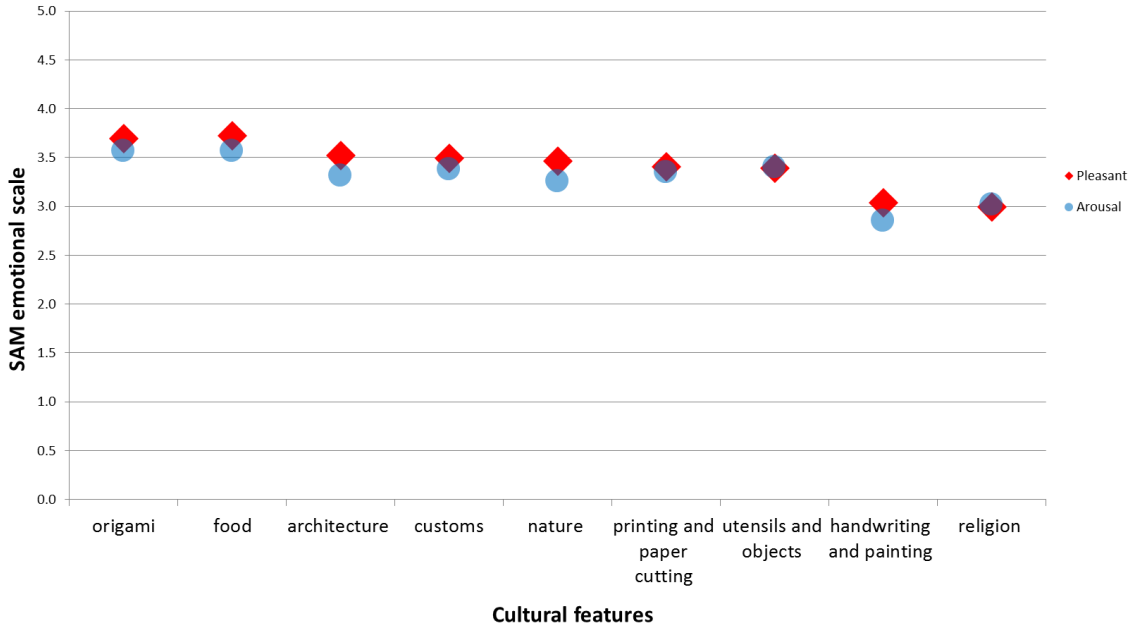


Figure 5.8 Pleasantness and arousal responses from Eastern participants

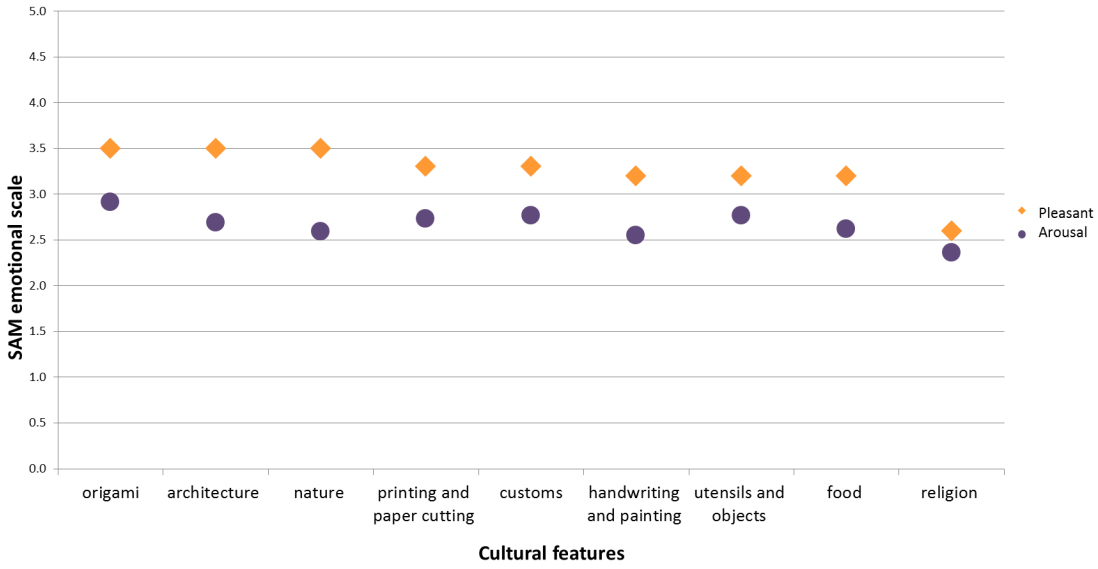


Figure 5.9 Pleasantness and arousal responses from Western participants

In Figure 5.10, the mean points of pleasantness by categories of cultural features from both groups are presented. The Eastern group perceived higher pleasantness in categories of printing & paper cutting, origami, utensils & objects, customs, food, and religion, while the Western population perceived higher pleasantness in categories of handwriting & painting. The categories of architecture and nature were perceived to be very similar. Whether Eastern and Western groups perceived pleasantness significantly different in every category is analysed in the following paragraph.

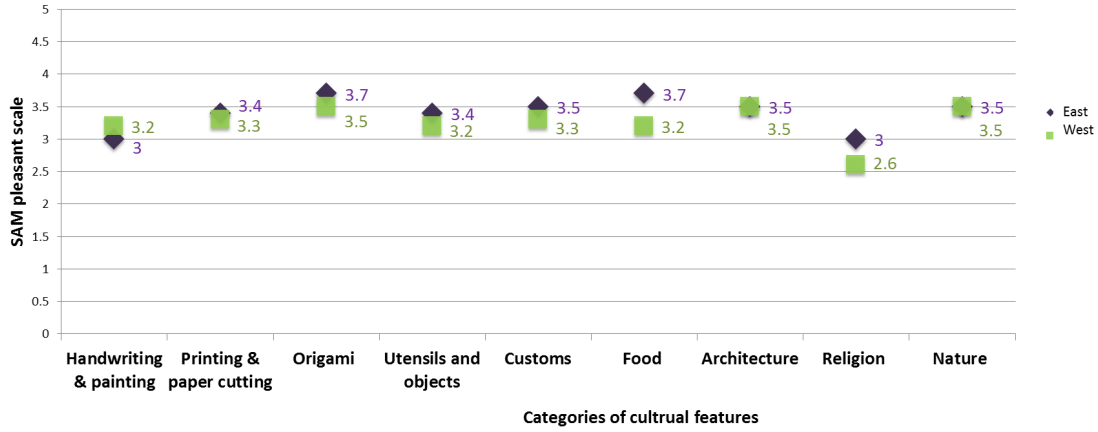


Figure 5.10 Pleasantness ratings from Eastern and Western participants

In order to test whether the products were appropriately grouped in the same categories of Chinese cultural products, Cronbach's Alpha, a statistic measurement of a reliability of a scale, is used to assess whether the same underlying attribute is measured by the scale. Thus, the reliability of every cultural category is tested by Cronbach's Alpha. Normally a minimum Cronbach's Alpha value is .7., but this is when the number of the items is more than 10. However, Nunnally (1978) and Pallant (2013) argued that Cronbach's Alpha value of .5 is acceptable and sufficient when number of items is less than 10. In each category of this study, the maximum number of Chinese cultural products was 7; therefore, the statement of Nunnally (1978) and Pallant (2013) is adopted. The Cronbach's Alpha values reported in Table 5.8 (see also Appendix B2) in each category are more than .5, which mean the pleasantness perceived within each category has good internal consistency, except from the category of nature.

Table 5.8 Reliability statistics of products in categories of cultural features

	Reliability statistics	
	Cronbach's Alpha	**Number of items**
M1) handwriting & painting	.532	6
M2) printing & paper cutting	.579	6
M3) origami	.751	7
M4) utensils and objects	.533	7
M5) customs	.557	5
M6) food	.533	2
M7) architecture	.570	2
M8) religion	.585	2
M9) nature	.423	3

Significance test will be carried out in order to know whether there is significant different among all cultural categories in relation to Eastern and Western groups. Field (2013) suggested that the sampling distribution must be normal so that the significance of groups will be accurate. A normality test will be carried out to check whether the sample is normally distributed. When the data is normally distributed, T-test will be carried out, but when the data is not normally distributed, a Mann-Whitney test will be conducted.

Kolmogorov-Smirnov[a] test is conducted to see whether the data is normally distributed. The result shown in Table 5.9 (see also Appendix B3) demonstrates $P < .005$ in every category, which means the data in all categories is not normally distributed.

Table 5.9 Tests of normality across all cultural categories

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
M1	.092	140	.006	.981	140	.045
M2	.124	140	.000	.979	140	.032
M3	.083	140	.019	.983	140	.073
M4	.092	140	.006	.981	140	.052
M5	.102	140	.001	.983	140	.088
M6	.114	140	.000	.957	140	.000
M7	.159	140	.000	.950	140	.000
M8	.126	140	.000	.961	140	.000
M9	.112	140	.000	.972	140	.005

a. Lilliefors Significance Correction

Hence, Mann-Whitney test is used to analyse which categories are perceived significantly different between Eastern and Western groups. The result shown in Table 5.10 (see more in Appendix B4) indicates that categories of M4 (utensils and objects), M6 (food), and M8 (religion) are perceived significantly differently between two groups.

Table 5.10 Test of Mann-Whitney U across all cultural categories

Test Statistics[a]

	M1	M2	M3	**M4**	M5	**M6**
Mann-Whitney U	2003.000	2267.000	2048.000	**1898.500**	2108.500	**1695.500**
Wilcoxon W	4488.000	4752.000	4533.000	**4383.500**	4593.500	**4180.500**
Z	-1.873	-.766	-1.680	**-2.306**	-1.431	**-3.182**
Asymp. Sig. (2-tailed)	.061	.444	.093	**.021**	.153	**.001**

Test Statistics[a]

	M7	**M8**	M9
Mann-Whitney U	2429.500	**1817.000**	2339.500
Wilcoxon W	4914.500	**4302.000**	4824.500
Z	-.087	**-2.670**	-.466
Asymp. Sig. (2-tailed)	.931	**.008**	.641

a. Grouping Variable: EW

Cultural products plotted in a two-dimensional space of the pleasantness & arousal

The products perceived from Eastern groups were plotted in a two-dimensional space of the pleasantness & arousal in Fig 5.11. The products which are plotted on the right-up quadrant are the most pleasant and aroused. These products are a tea bag inspired from the ancient printing technique (No.12), a lamp inspired from origami (No.19), a seasoning set inspired from clothing fashion of the ancient time (No. 27), and a traffic signal (No. 29) inspired from traditional lanterns. Conversely, the products plotted in the left-down quadrant are the most unpleasant and calm. A necklace (No.5) inspired from brushes of Chinese calligraphy sits in this area.

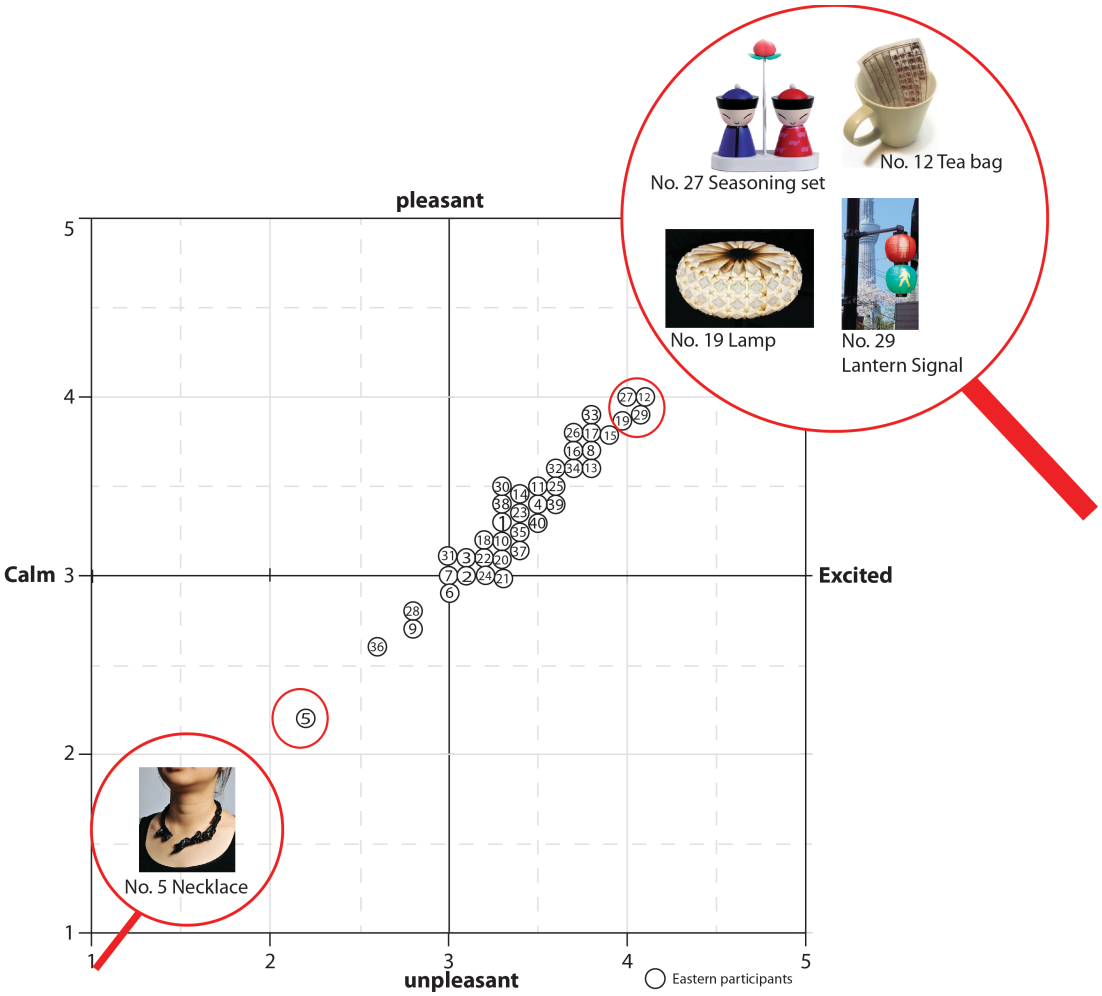


Figure 5.11 The two-dimensional affective space defined by the mean ratings of pleasure and arousal of Chinese cultural products from eastern cultural participants

The products perceived from Western groups were plotted in a two-dimensional space of the pleasantness & arousal shown in Figure 5.12. The higher pleasant and excited images of products from Western perception are a chair (No. 15) and two types of light form (No. 13 & No. 19) inspired from origami as well as a book shelf (No. 25) inspired from a tangram, which is a set of seven flat geometric shapes. Besides, this book shelf was tranferred from two-dimentsional flat shapes to a three-dimentsionl space where books can be placed. Conversely, the toys (No. 36) inspired from religions were perceived unpleasant and calm.

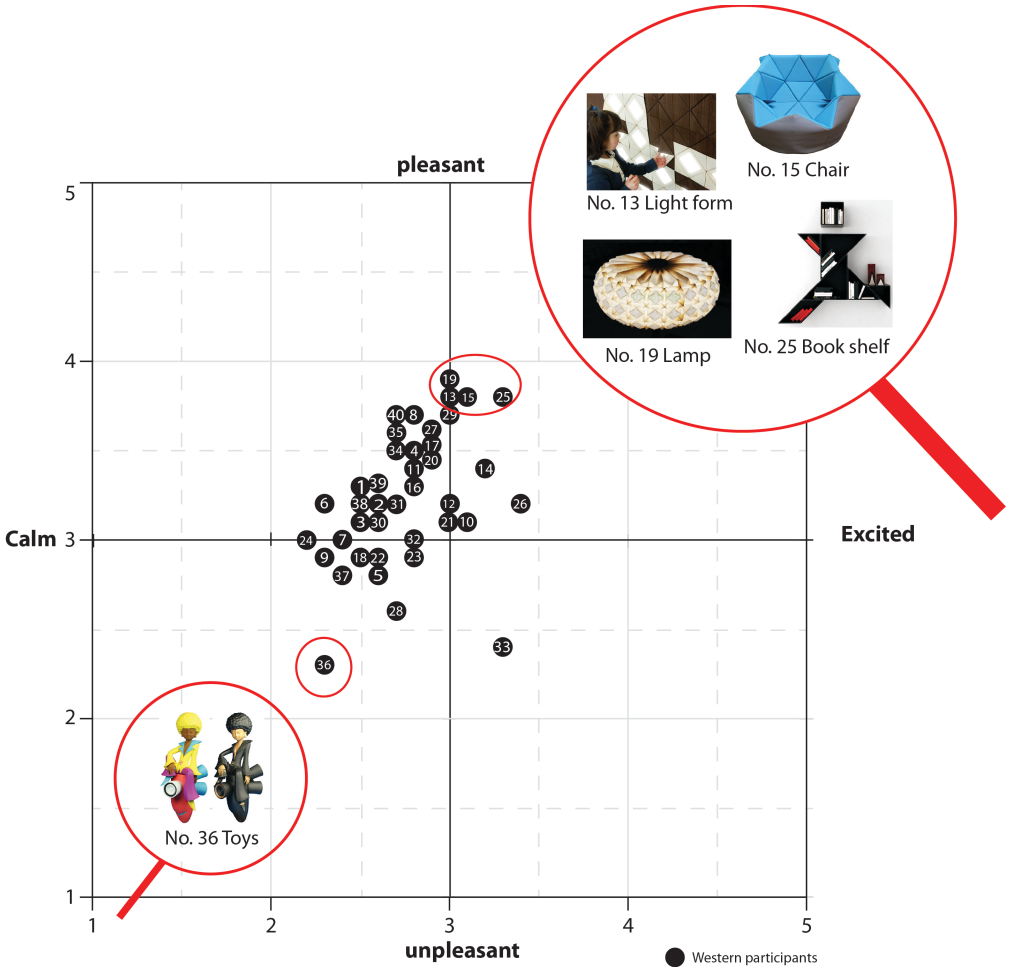


Figure 5.12 The two-dimensional affective space defined by the mean ratings of pleasure and arousal of Chinese cultural products from Western cultural participants

5.4.2. Results from Emotional Descriptors

The results shown in this paragraph are based on the section B of the questionnaire, which is an assessment of 12 emotional descriptors. Emotions that can be aroused by a certain cultural feature are suggested based on the results.

From Eastern participants

The frequency of selection of emotional descriptors in all Chinese cultural products by Eastern participants is shown in appendix B5-1. The frequency of selection is calculated into a percentage to show an overview of emotion aroused by Chinese cultural products. In general, Chinese cultural products were perceived as positive, and the most frequent selected positive emotion descriptor is “attracted” (24%), followed by self-expression (15%) and luxurious (11%). The most frequent selected negative descriptor is “bored” (8%), followed by confused (7%), and cheap (4%) (Figure 5.13).

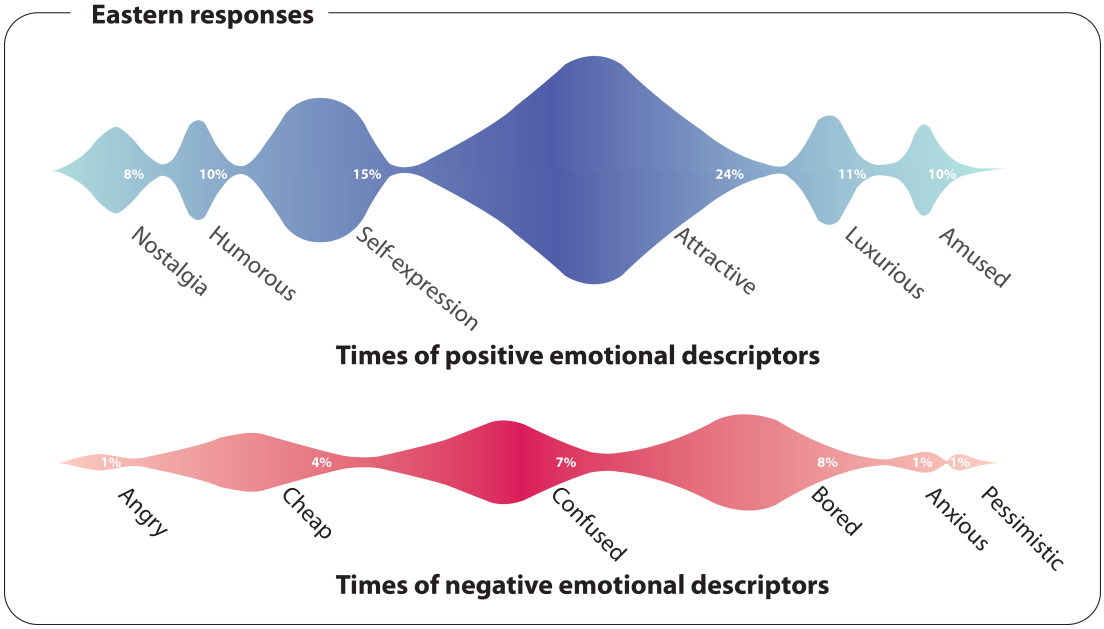


Figure 5.13 Percentage of ticked emotional descriptors from Eastern viewpoints

Each product was classified into their belonged category of cultural features, so emotions aroused by different cultural features were explored. The original data of frequency of selection by cultural categories is shown in Appendix B5-2. The amounts of the Chinese cultural products in each category were different; therefore, these original numbers were divided by the numbers of products in each category. The result is displayed in Appendix B5-3.

Results by cultural features

From this analysis, every cultural feature has its own particularly higher aroused emotions (Table 5.11). The highest valued positive emotion descriptor is “attractive” in every category of cultural feature, except category of religion. On the other hand, the highest valued negative emotion descriptor is ‘bored’ or ‘confused’ in every category.

Table 5.11 Emotions aroused by each category of cultural feature from Eastern participants

Emotion descriptors	Positive emotion descriptor from the Easterners						Negaitive emotion descriptor from the Easterners					
	Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Passimistic
Handwriting and painting	19			12		14			12		7	
Printing and paper cutting	22			17		14			5		4	
Origami	30			16	17				6		2	
Utensils and objects	24			16	14				10		4	
Customs	22	16	15						6		3	
Food	22	21	24						2		6	
Architecture	28			22	13				6	2	2	
Religion		20	17					6	8			
Nature	24	15		15					5		6	

Unit: %

Results by aroused emotions

According to each emotional descriptor (Appendix B5-4), it was explored which cultural feature was highest rated. For instance, in the row of attractive, ‘origami’ was selected the most as average 34.3. These average selected numbers were converted to percentage shown in table Appendix B5-5. The percentage of each cultural feature in the row of emotion descriptor over 15% was marked (Table 5.12). For example, the rating over 15 % in the row of attractive is origami. This selection

contributed to the categories of design card deck (Chapter 6). For instance, humorous emotion is normally aroused by products inspired from food, architecture, and religion.

Table 5.12 Positive and negative emotions aroused by particular cultural features from Eastern participants

	from Easterners								
Cultual features / Emotion descriptors	Handwriting & painting	Printing & paper cutting	Origami	Utensils& objects	Customs	Food	Architecture	Religion	Nature
Attractive			15.4						
Humorous						18	16.2	16.2	
Amused						22			
Self-expression		15.1		15.9					
Luxurious			21.6	20.8					
Nostalgia	19.6	24.9		18.2					
Bored	19						18.1		
Angry								60.7	
Confused				19.4					
Anxious					15.2			27.6	
Cheap						15.8			15
Passimistic					18.6		17.4	23.3	

Unit: %

From western participants

The frequency of selection of emotional descriptors in each Chinese cultural product by Western participants is shown in Appendix B5-6. The frequency of selection was calculated into a percentage to show an overview of emotion aroused by Chinese cultural products. In general, Chinese cultural products were perceived positive and the most frequent selected positive emotion descriptor is “attractive” (22%), followed by amused (13%), and luxurious (12%). The most frequent selected negative descriptor is “confused” (10%), followed by bored (9%) and cheap (7%) (Figure 5.14).

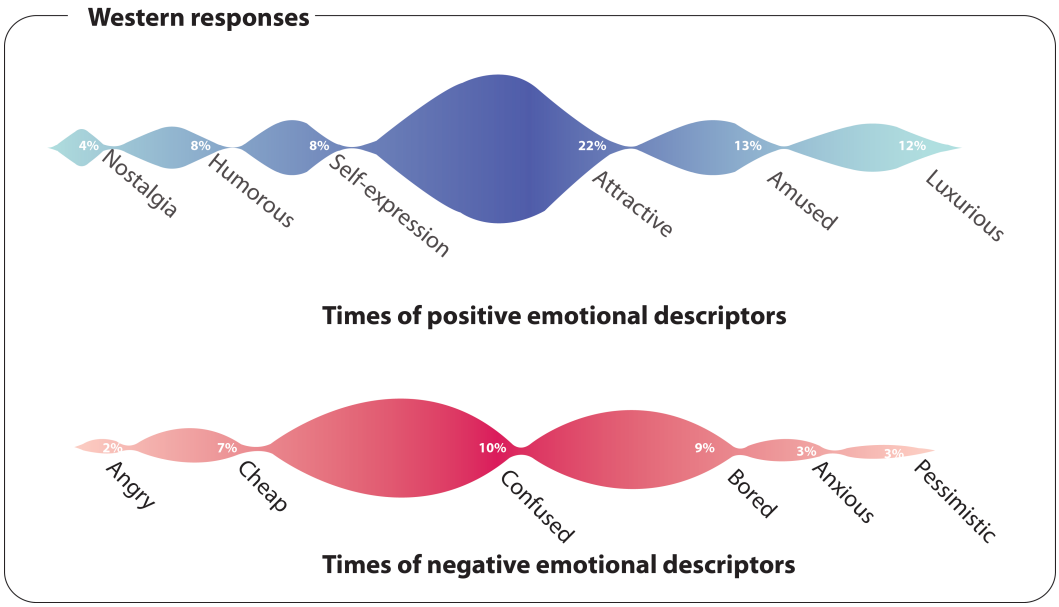


Figure 5.14 Percentage of selected emotional descriptors from Western viewpoints

Results by cultural features

Each product was classified into their belonged category of cultural features, so emotions aroused by different cultural features were explored. The original data of frequency of selection according to different category of cultural features is shown in Appendix B5-7. However, different amounts of Chinese cultural products in each category were different; therefore, these original numbers were divided by the numbers of products in each category. The ratio of the emotion descriptor in each cultural feature (horizontal) is shown in Appendix B5-8. From this analysis, every cultural feature has its own particularly higher aroused emotions (Table 5.13). Taking 'origami' as an example, it aroused more "attractive" "luxurious" and "amused" emotional experiences.

Table 5.13 Emotions aroused by each category of cultural feature from Western participants

Emotion descriptors / Cultal features	Positive emotion descriptor from the Westerners						Negaitive emotion descriptor from the Westerners					
	Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Passimistic
Handwriting and painting	24		11		11		13		13			
Printing and paper cutting	25		13		11		8		8		9	
Origami	25		13		16		8		8			
Utensils and objects	21		10		14		9		12			
Customs	21	13	16						9		7	
Food	19	18	21				7		9			
Architecture	26		10	10	19		13		3			3
Religion	8	16	16						14		14	
Nature	27		16		15		8		7			

Unit: %

Results by aroused emotions

According to each emotional descriptor (Appendix B5-9), in the row of attractive, for instance, 'origami' was selected the most as average 23.3. These average selected numbers were converted to percentage shown in Appendix B5-10. The percentage of each cultural feature in the row of emotion descriptor over 15% was marked (Table 5.14). For instance, self-expression feeling is normally aroused by products inspired from printing and paper cutting.

Table 5.14 Positive emotions aroused by particular cultural features from Western participants

	from Westerners								
Cultal features / Emotion descriptors	Handwriting & painting	Printing & paper cutting	Origami	Utensils& objects	Customs	Food	Architecture	Religion	Nature
Attractive									
Humorous					17.9	24.4		18.8	
Amused						18			
Self-expression		15.6							
Luxurious			16.6				16.6		
Nostalgia	23.1			18.4					
Bored									
Angry				18.1	22.2			15.9	
Confused				15.1				15.9	
Anxious				17.5	19.2				
Cheap		15.8						22.7	
Passimistic					16.8			21	

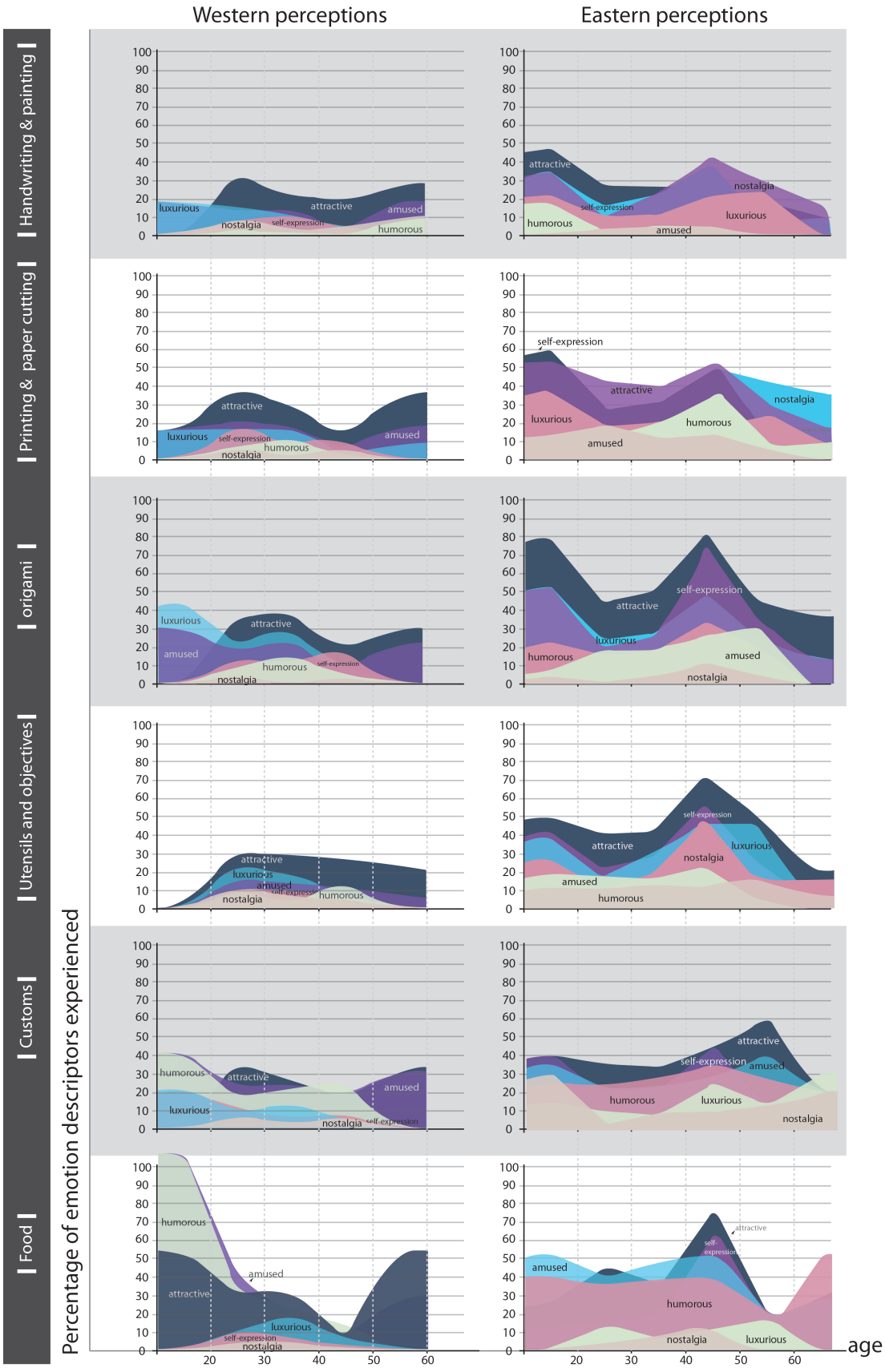
Unit: %

Percentage of Perceived Emotions change across different ages.

Figure 5.15 is appeared in pairs by Eastern and western groups in order to show six positive emotional responses by different age ranges. The changing of every emotion descriptor cross different age ranges is displayed in different colours and emotions which were highly perceived at a certain age range can be easily observed. This information is based on the results shown in Appendix B7. The percentage shown in Appendix B7 was calculated according to different numbers of population in each age group. Western population of age under 19 is not discussed in this section because there is only one person in this group, which caused bias.

Taking origami as an example (the third row of Figure 5.15), attractive was highly perceived by Eastern people age under 19 and age between 40 and 49. Self-expression was highly perceived by Eastern people age from 40 and 49. Luxurious was highly perceived by Eastern people age under 19 and age between 40 and 49. From Western perception of origami-inspired products, attractive was highly perceived by people age between 20 and 39. Amused was perceived highly from people age between 20 and 39 as well as between 50 and 59. Luxurious was highly perceived by people age between 30 and 39.

Overall, the 6 positive emotions in relation to the categories of cultural features were similarly experienced across ages from western groups, whereas the emotions were variously experienced across Eastern age groups. Therefore, when designing Chinese cultural products for Eastern populations, the age of consumers is suggested to take into account.


Western perceptions
Eastern perceptions
Handwriting & painting
Printing & paper cutting
origami
Utensils and objectives
Customs
Food
Percentage of emotion descriptors experienced
age
luxurious
attractive
amused
nostalgia
self-expression
humorous

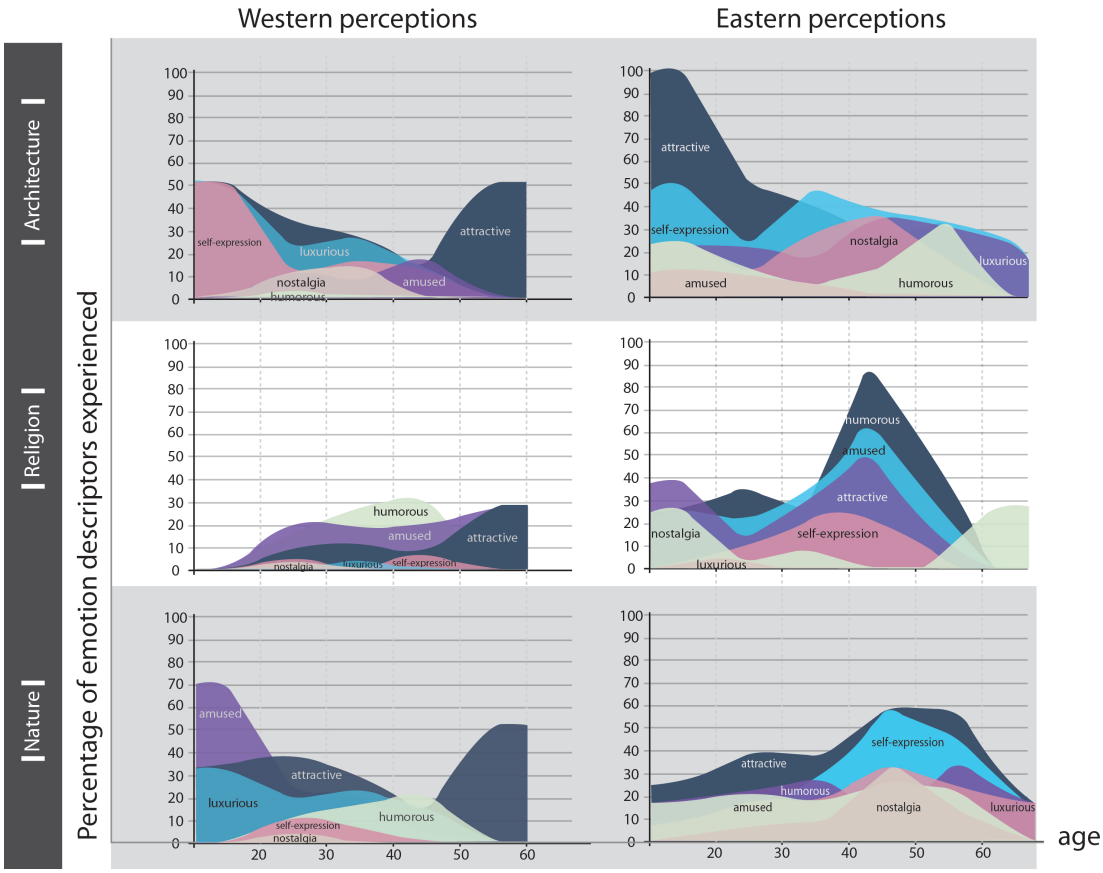


Figure 5.15 Positive emotions aroused from different cultural features displayed by age range

5.5. Results of the Chinese Cultural Products based on Emotional Attributes

In the following section, more details about products which aroused the same emotional experience are grouped together regarding to Eastern and Western perceptions. Products in the circle of the East referred to the aroused emotion by the products particularly perceived from Eastern population and products in the circle of the West meant the aroused emotions perceived by Western populations (Figure 5.16). The overlap part in the middle refers to the products which caused the emotion by both populations.

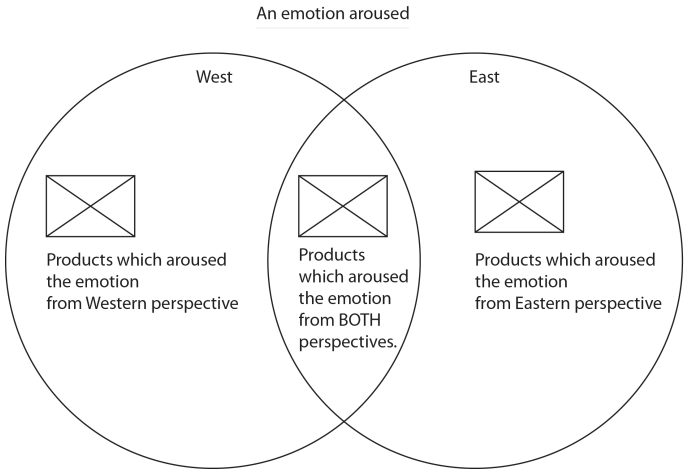


Figure 5.16 A framework of emotional responses from Eastern and Western groups

5.5.1 Attractive

Attractive was aroused from products inspired from origami particularly from Eastern perspective (Fig. 5.17). More than 15% of Eastern population perceived origami as attractive (15.4%), while less than 15% of Western population did. Therefore, only origami-inspired products which highly valued by Eastern population was discussed in this section.

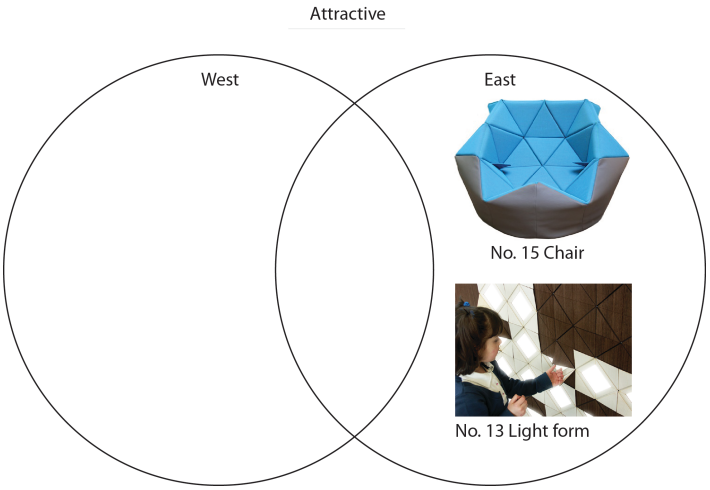


Figure 5.17 Chinese Cultural products which aroused attractive perception

Origami

Origami is a traditional art which was one of the leisure entertainments in the past. Paper is used and folded into different shapes. Products inspired by origami were experienced as more attractive than all other cultural features; especially from an Eastern perspective. Origami-inspired products were in total seven products from No.13 to No.19, and the frequency of selection of every emotional descriptor were shown in Appendix B6-2. The most attractive origami-inspired product is No.13 (lighting by Francesca Rogers and Daniele Gualeni Design Studio) and No. 15 (chair by Kale).

The lighting (No.13) may have been perceived attractive because of the reversal function of origami; origami is used to fold something for the shapes. However, the light can be unfolded from the origami design case. The chair (No.15) was made of repeated basic shapes of origami. Keeping simple geometric shapes repeated is perceived as attractive.

5.5.2 Humorous

The Chinese Cultural products inspired from food (No.32 & No.33), religion (No. 37), architecture (No.34 & 35), and customs were experienced as more humorous than others. Food and religion are the common features which were perceived as humorous by both Eastern and Western populations (Figure 5.18). Therefore, products inspired by food and religion are described first, followed by architecture (from Eastern perspective) and customs (from Western perspective) in the following paragraphs.

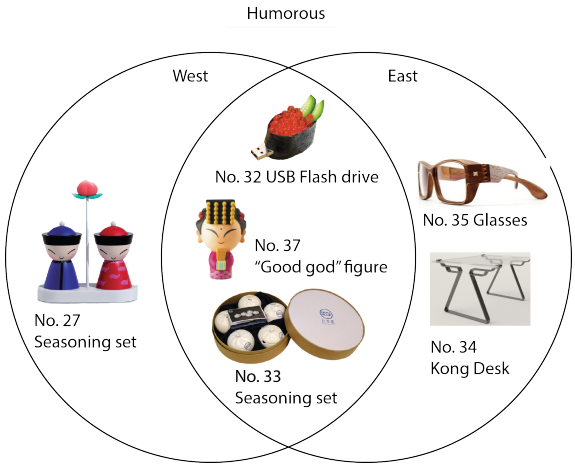


Figure 5.18 Chinese Cultural products which aroused humorous perception

Food

Some specific cuisines or food could symbolise fortune, blessing, happiness, good luck or longevity. Two sample products (No.32 and No.33) in total were inspired by food which aroused humorous emotion (Appendix B6-3).

The two products which were inspired from food are a flash drive (No.32) inspired by sushi shape, and a seasoning set (No. 33) inspired by Chinese buns. For the sushi-shape flash drive, the size and colours were almost the same as the food itself, but it turned out to be a technological item. It may be because of the different combination of food and technology, this aroused a humorous emotion. However, when a product inspired by food was designed to use in a dining context such as the seasoning set (No. 33), it was perceived more humorous for the Eastern population, but not for the Western population.

Religion

Statues of Buddha or Gods in general are placed in temples or homes for God blessing upon people. Also, different Gods are in charge of different affairs. Two samples (No. 36 and No. 37) are included in this category. A toy of a god figure (No. 37) was perceived as most humorous in the category of religion from both cultural backgrounds (Appendix B6-4).

The factor that makes a serious religion topic turn into a humorous product is more likely because of the changed proportion of the figure, simplified shapes and the bright colour matching.

Architecture

Architecture comprises many parts such as ceilings, columns, entablature, doors, floors, gate, ornaments, windows, walls, stairways and so on. For example, Dougong, which is allowed to be used in palaces and temples, is one of the distinctive structures in Chinese architecture. It is also a symbol of a person's social status and identity. Also, the function of these multiple interlocking bracket sets is supporting and transferring weight of horizontal beams and vertical columns. Dougong follows symmetric structural rules, but complicated decorated. Two examples (No. 34 and No. 35) inspired from architecture were perceived humorous from most of the Eastern population (Appendix B6-5); especially a desk (No. 34) inspired from supporters of architecture.

Both products, a desk (No.34) and a frame of glasses (No.35), were perceived as humorous from an Eastern perspective. The idea of supporters of the desk came from dougong, and the structure of dougong was simplified and minimized. Also, the frame of the glasses was inspired by tenon which is a structure to connect more than two pieces of wood or to make a revolving axis for a door. This function is more likely to apply on a big object such as a door, furniture or building; however it was adapted to a small part of a pair of glasses. Therefore, it may be because of the reduced size that makes the products more humorous for the Eastern population.

Customs

Five examples (No. 27 to No.31) are inspired from customs (Appendix B6-6). These customs-inspired products were perceived as humorous particularly from the Western population. A seasoning set made by Alessi (No.27) was highly valued by the Western population.

Customs includes people's habits, social events, festivals or fashion. The Alessi seasoning set was inspired from the clothing fashion of the ancient time. The contour of a figure was simplified and scaled as well as the colours turned to be brighter. These types of products which change the proportion of a figure to make them look cute would most likely lead to be perceived humorous, such as the example in the category of religion.

5.5.3 Amused

Only the Chinese cultural products inspired from food are perceived amused by more than 15% of the population from both cultural backgrounds (Figure 5.19). Therefore, only cultural feature of food was highlighted in this section.

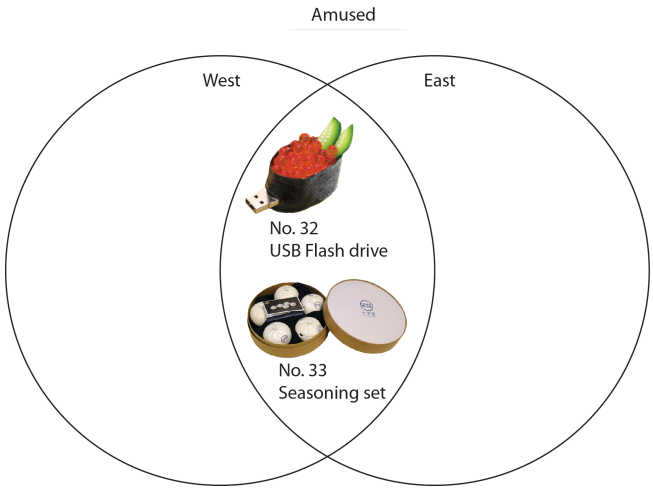


Figure 5.19 Chinese Cultural products which aroused amused perception

Food

Two sample products (No.32 and No.33) in total inspired by food aroused an amused emotion (Appendix B6-3). The common product which was perceived humorous from both cultural backgrounds was the Sushi shape flash driver (No. 32).

The two products which were inspired from food are a flash drive (No.32) inspired by sushi shape and a seasoning set (No. 33) inspired from Chinese buns.

5.5.4 Self-expression

Products inspired from printing and paper cutting (No. 10) were perceived as self-expression from most of Eastern and Western participants. Also, products inspired from utensils and objects (No. 20) aroused self-expression by most of the Eastern population (Fig. 5.20). Therefore, the common cultural feature of printing and paper cutting was elaborated firstly, followed by utensils and objects in this section.

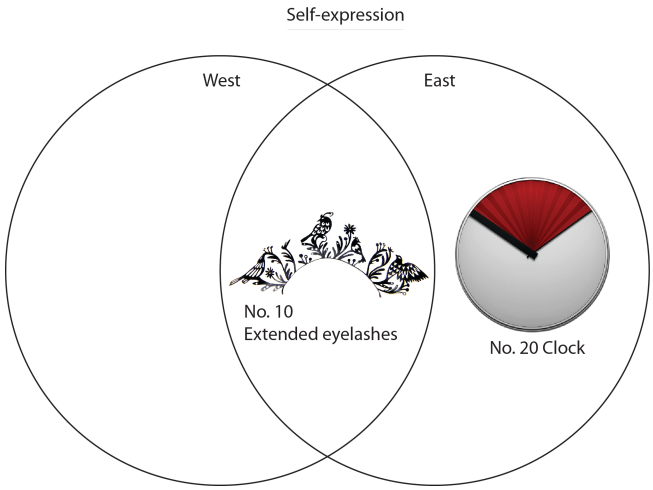


Figure 5.20 Chinese Cultural products which aroused self-expression perception

Printing and paper cutting

Six samples (No.7 to No.12) were included in the category of printing and paper cutting. Extended eyelashes (No. 10) were perceived as self-expression from both Eastern and Western population (Appendix B6-7).

Paper-cutting is a traditional folk art which is made by cutting or graving on a single piece of paper or on a folded even numbers creases. Its main features are symmetric, engraving through, and red. Auspicious patterns are the most common themes. In addition, original paper-cutting was used to paste on the wall, door or pots to welcome good luck and wishes, particularly in a wedding party or Chinese New Year. The extended eyelashes (No.10) were inspired from the techniques of paper-cutting, and the colour was changed from red to black to fit eyelashes. The product scaled

the size into a tiny and delicate decoration of eyelashes. This product is very sophisticated and the function was transformed from house decoration to eye decoration. These factors might lead products to be perceived as self-expression.

Utensils and Objects

In total, seven products are in this category and a clock inspired by a fan (No. 20) was perceived the most self-expressive which got the highest selected time (63) by Eastern population (Appendix B6-8).

A fan was used to make cool breeze, to show one's social status or to be a tool for performance. The special characteristic of a foldable fan is its folding and expanding function. In the example of the clock (No. 20), the folding and expanding function of a fan was designed to show the time. This interestingly transforming function makes the product showing the owners' taste and expressing their uniqueness.

5.5.5 Luxurious

Origami is a common cultural feature that aroused luxurious feeling by both Eastern and Western population. In addition, products inspired from utensils and objects aroused luxurious emotion from Eastern perspective, while products inspired from architecture aroused luxurious feeling from Western perspective (Figure 5.21). Thus, cultural features of origami, utensils and objects, and architecture were discussed in sequence.

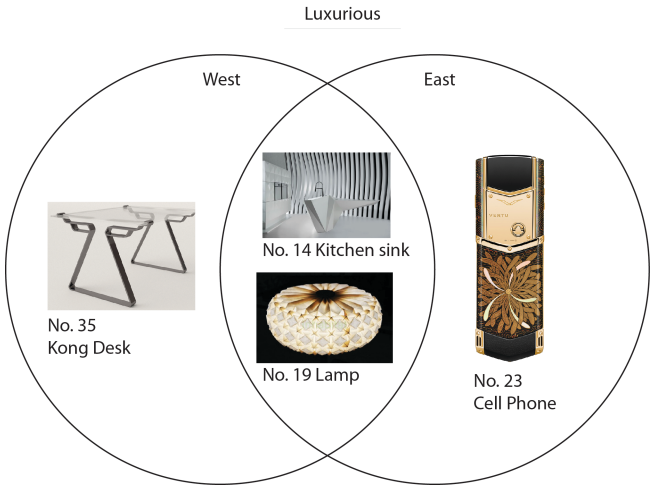


Figure 5.21 Chinese Cultural products which aroused luxurious perception

Origami

Products inspired from origami aroused a luxurious feeling from both Eastern and Western population. Seven products were in the category of origami; a lamp (No.19) from Eastern perspective and a kitchen sink (No.14) from Western perspective were perceived as the most luxurious products (Appendix B6-2).

The shape of the kitchen sink (No.14) was inspired from the shape of origami, and was enlarged from the size of tradition paper folding to a large scale of kitchen sink. The luxurious feeling might be due to the pure white colour, neat, and simplified contour. The other product, a lamp (No.19) adapted the material, pattern and folding techniques of origami. The small and delicate repeating units might constitute and arouse luxurious feeling.

Utensils and objects

Luxurious feeling was aroused by products inspired from utensils and objects particularly from an Eastern perspective. In total, seven products are in the category of utensils and objects, however, from an Easter perspective a cell phone (No. 23) was perceived as the most luxurious product (Appendix B6-8).

Ceramics and lacquer wares were a symbol of noble or royal family and they showed the preference of the owners or scholars. The characteristics of different kinds of ceramics could be various, such as classic colours, patterns or split effects of the glaze. For example, the pattern, colour matching and lacquer techniques of utensils and objects were adopted to design a luxurious cell phone. The luxurious feeling was particularly aroused by the Eastern population, maybe because the meaning of the pattern was understood, the lacquer colours were preferred, and technology products such as cell phones are generally popular.

Architecture

Luxurious feeling was aroused by architecture particularly from a Western perspective. A desk (No.34) was perceived to have a more luxurious feeling than others (Appendix B6-5).

This desk was inspired from the system of wood brackets on the top of a column supporting the crossbeam in Chinese temple building. The outline of the structure was simplified and the material was replaced from wood to modern materials such as glass and metal (No. 34). The combination of new materials might give a luxurious feeling.

5.5.6 Nostalgia

Nostalgia was aroused by products inspired from handwriting and painting (No.3 & No. 6) as well as from utensils and objects (No. 22 & No. 24) from both Eastern and Western population. In addition, products inspired from printing and paper cutting (No. 9) also aroused nostalgia from an Eastern perspective, while products inspired from architecture (No. 35) aroused nostalgia from a Western perspective (Figure 5.22).

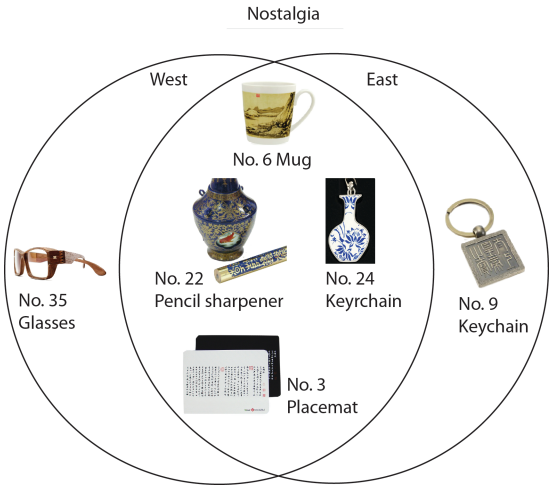


Figure 5.22 Chinese Cultural products which aroused nostalgia perception

Handwriting and painting

Six products (No.1 to 6) are inspired from handwriting and painting; a placemat (No.3) and a mug (No. 6) were perceived the most nostalgia inspiring products (Appendix B6-9).

Calligraphy is a visual art of writing and also its content is literature, poems, and epitaph. The features of calligraphy are lines, strokes, and the effects of ink. The applications are a famous Chinese calligraphy which was printed on a placemat (No. 3) and a Chinese painting which was printed on a mug (No. 6). These two products almost copied the original art work, and scaled the size to fit on the products, so lines, images as well as the colours were almost the same as the original source. This is most likely the factor that makes a product be perceived as arousing nostalgia.

Utensils and objects

Seven products (No. 20 to No. 26) are inspired from utensils and objects; a keychain (No.24) and a pencil sharpener (No. 22) were perceived as the most nostalgia arousing products (Appendix B6-8).

The pencil sharpener (No. 22) is a reduced version of the original art work, a revolving vase with swimming fish decoration, and the function has been changed to be a sharpener evolved from the revolving inner axis. The keychain (No. 24) had the

pattern of Chinese blue and white ceramics printed on it, the pattern of wealthy meaning attached and the primitive colours were adopted, but the lines were simplified. These products aroused nostalgia which might be because they were very similar to their original artwork.

Printing and paper cutting

Products inspired from printing and paper cutting were perceived as arousing nostalgia mainly from Eastern participants. A keychain (No. 9) was highly perceived as inspiring nostalgia in the category of printing and paper which got 40 ticks from Eastern population (Appendix B6-7).

Seal carving is a combination of calligraphy and the skills of making stamps. These stamps symbolised owners' social status or their power. Gradually, it was broadly used in art works of calligraphy and paintings. Also, characters carved on the stamps can be concaved or raised which results in white or red characters. The keychain (No.9) was a copy of a reduced size stamp of a Chinese King, and the material was changed from stone to metal. Except that the function was changed from making a printing to be a keychain, and the size was reduced, this product is almost the same as the original one.

Architecture

Nostalgia was aroused by architecture particularly from a Western perspective. Two samples are included in architecture-inspired products, but a wood frame of a pair of glasses (No.35) was perceived as inspiring more nostalgia than the others (Appendix B6-5).

Tenon is a traditional structure to join two or more than two wooden pieces to form a strong object, such as furniture or building. On the whole, this structure is composed by mortise and tenon. A mortise is a cavity exactly where can receive and fit a tenon. This frame of the glasses was inspired from this traditional connecting structure, and wood was retained in the product design (No. 35). The structural

technique and material are adapted from the original architecture, however the function was changed to adapt to a small gadget of a pair of glasses.

5.6 Discussion

The participants recruited for the survey were general consumers and the questionnaires were spread by the researcher to any possible and potential consumers around. As the initial study of emotional experiences of cultural product, this way could possibly investigate general emotional experiences for cultural products. However, the results might only reflect the emotional experiences of consumers whom the research could reach.

The results of this study presented the population of age mainly between 20 and 39, due to the participated population age distribution. Although the recruitment tried to cover different ages, the result from Western population age under 19 was not discussed because there was only one participant in the age group and it could lead to severe bias. The researcher tried to cover all range of the age groups, but the number of participants recruited were various in the age distribution. Thus, the result of the investigation cannot be representative for each age group, but the various age groups can show that people in different age had diverse reactions of their emotional experiences toward Chinese cultural products. The shortcoming of the approach is that 1) the number of participants in different age is not evenly distributed and 2) a random recruitment was supposed to show general emotional responses or preferences, however this approach caused that the sample can only reflect the emotional experience of the participants in this research and is difficult to represent of the whole. This research can therefore be the initiative study for investigating the emotional experience of Chinese cultural products and possibly provide supports for designers who work in creating Chinese cultural products.

Summary

The analysis of the questionnaire helped to answer the following questions.

- How do Eastern and Western population emotionally appraise Chinese cultural products?
- What emotions could be expressed in reaction to certain Chinese cultural features?

The findings were based on the nine categories of Chinese cultural features (section 2.3) and 12 emotional descriptors which were selected from academic research and commercial-oriented emotional brands in order to investigate emotional appraisal from different cultural backgrounds. This chapter results in a foundation for the development of the toolkit for designers to enhance emotional attachment to Chinese cultural products.

Both populations perceived pleasantness from Chinese cultural products and there was not significantly difference between groups across all products, except the eight products shown in Figure 5.7. From the perspective of pleasantness perceived by cultural categories, three categories which were utensil & object, food and religion were found to be significantly different between two groups, and Eastern group perceived higher pleasantness than western group. Hence, designers are recommended to be aware about the cultural background of their target users when applying cultural features from utensil & object, food, and religion.

In general, Eastern population perceived slightly higher pleasantness than Western population, and this might have resulted from the fact that for Eastern participants the products selected were all Chinese inspired and the Eastern population who are in the cultural context have more understanding and emotional connection with these products. It proved the argument of the literature review that meaningful experience is established when humans' new impression met their past experience, where Eastern participants are more familiar with Chinese cultural metaphors. However, it is also a challenge that there is still room to improve Chinese cultural products for the Western population.

From an Eastern viewpoint, Chinese cultural products which are plotted in the quadrant of higher pleasantness and higher arousal are those inspired from printing and paper cutting, origami and customs. From a Western viewpoint, Chinese cultural products which are plotted in the quadrant of higher pleasantness and higher arousal are those inspired from origami (mainly) as well as utensils and objects.

In this study, it was found that each Chinese cultural feature has its highly correlated emotional responses, as shown in Figure 5.23. This research explores there is a link between a cultural feature and its possibly correlated emotional experiences. For example, within this research, the category of handwriting and painting could arouse nostalgia, printing and paper cutting could arouse self-expression and nostalgia, origami could arouse attractive and luxurious, utensil and object could arouse self-expression, luxurious and nostalgia, custom could arouse humorous, food could arouse humorous and amused, architecture could arouse luxurious and nostalgia as well as religion could arouse humorous. The fact that a Chinese cultural feature arouses different emotional responses might be due to the different applications of design features.

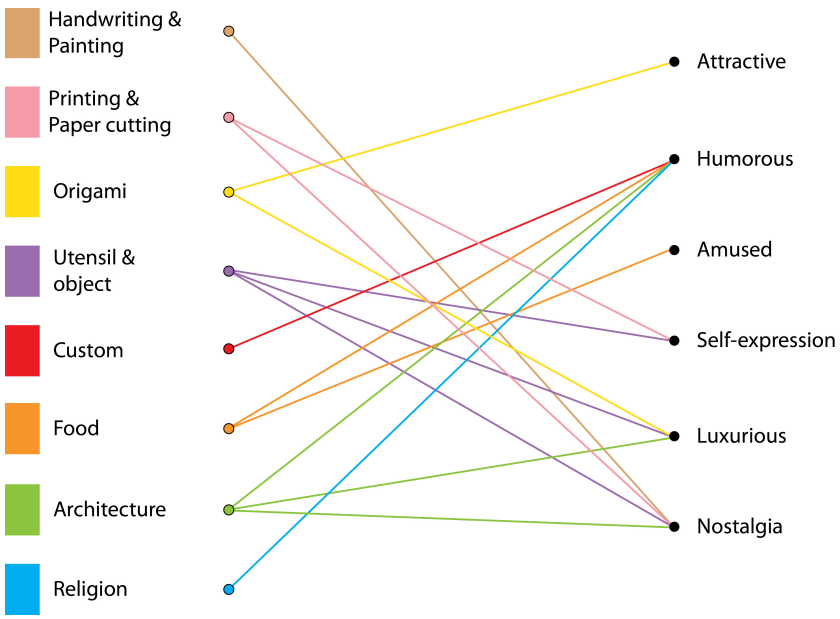


Figure 5.23 Corresponding emotional responses to cultural features

Although the emotional responses are not restricted to the ones shown in this research, however, this research shows the possibilities of the correlations between cultural features and emotional responses. Within this study, the Chinese cultural products were assessed and the result suggests the possibility that cultural features are linked with some certain emotional experiences, which can be seen as a starting point for emotional design in Chinese cultural products. As shown in Figure 5.23, humorous and nostalgia were the mostly aroused emotional experiences in this investigation. This result shows that the Chinese cultural products collected in the research are more possible to elicit nostalgia and humorous feelings. The common point of the products, which elicited more 'nostalgia' feelings, is that they were mainly collected from museum gift shops and these products are mainly inspired from art-related cultural features. On the contrary, the products that elicited 'humorous' feelings are mainly not in the art-related categories.

Within the investigation, the nostalgia feeling is more possible related to 'handwriting & painting', 'printing & paper cutting', 'utensils & objects', and 'architecture'. In addition, these products, which aroused nostalgia feelings, were created by using the design features such as copying the patterns or images of the original cultural features. That is to say, when the products are superficially decorated with traditional patterns or images, these products tend to deliver a feeling of nostalgia.

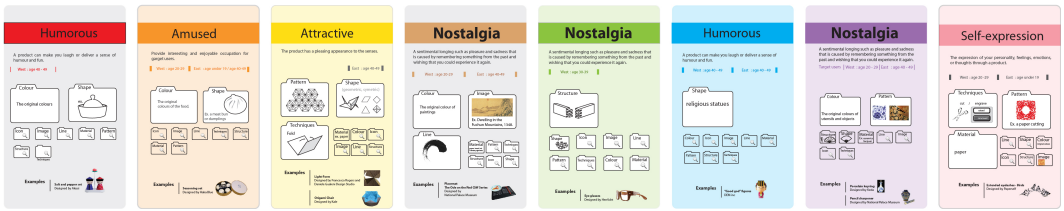
The result of this study suggests that people feel humorous toward the products inspired from 'custom', 'food', 'architecture', and 'religion'. The common design figures of these 'humorous' products are 'shape' and 'colour' and the use of these design features tends to deliver humorous feelings. For example, in the category of food, when the shape of the product is exactly the same as its original food and the product is designed for other functions, it was perceived humorous, such as the sushi shape flash driver. In the category of customs and religion, the god or human figures were scaled into a smaller size, which aroused humorous feelings.

Therefore, by analysing the design features applied on these products, it shows that if images or patterns of original artwork were copied onto the products, they tend to arouse a nostalgia feeling. When a product was made by changing the proportion of a figure, it would arouse a humorous feeling even though the product was inspired from a serious religious statue. The luxurious feeling tends to be aroused by origami–inspired products may be because of the repetition unit of forming products and the materials.

In conclusion, the main information, which will be provided in the design toolkit, is cultural features, design features, correlated emotional responses, examples of Chinese cultural products and the age of target users, which have been found from the study presented in this chapter. In addition, the numbers of the cards will be based on the numbers of emotional experiences that cultural feature elicited (Figure 5.23). Taking 'origami' for example, there will be two cards in this category, which one for 'attractive' and one for 'luxurious'. The development of the toolkit will be described in the next chapter.

6

DEVELOPMENT OF THE TOOLKIT FOR CHINESE CULTURAL PRODUCTS (Prescriptive Study and Descriptive Study II)



Following the clarification from literature review, the design process of cultural products began with extracting representative features from local culture, and these cultural features would be applied and transformed (design features) into creating new products (In section 2.1.4). However, there has not been a practical solution which could assist designers in triggering creative thinking during a brainstorming process for cultural products. In addition, this research took users' emotional experiences of cultural products into account. Therefore, a toolkit was developed to provide information about the possible connections between a cultural feature and correlated emotional experiences. Thus, cultural features, design features, and correlated emotional experiences were selected as the main information, which would be the answer to the forth research question: *what information a cultural product toolkit should have for designers?*

6.1. Development of the Card Deck

An iterative process was adopted in the development of the toolkit. The iterative process was needed so as to gain feedback from designers on the appearance of the card deck, the information the card provided, and the effectiveness or easiness of using the card deck. A total of six iterations were used as appraisal for this study. Iterations from one to four were conducted with design experts by interviews to spot problems, and iterations from five to six were conducted with designers by workshops to improve the usability of the card deck.

In iterations with design experts (Figure 6.1), a series of interviews was conducted with two experienced product designers from developing the initial prototype, exploring more potentially needed information, optimising the contents, and finalising the layout and contents. The experts were recruited from design professionals in the team of human centred design institution of Brunel University London who have both practical design and research experiences. The experts who show their interests in applying cultural features in modern products were chosen. One of the designers had five year working experience and the other one had ten

years working experience as product designers. The interviews aimed to test and evaluate the iterations of the cards in practice before conducting workshops. Through a series of group experts' interviews with designers and the feedback received, the card deck was validated and improved. In addition, how designers involved cards in their brainstorming process was taken into consideration. The contents of the cards included information of cultural features which were categorized (section 2.3), design features which have been currently applied (section 2.4) and emotional descriptors which were selected (section 5.2). The criteria of validating the card deck by expert interviews are in two folds: contents and layout. The cultural features, design features, and descriptors of emotional experiences were therefore used to generate the contents of the card deck. Regarding the appearance of the card deck, layouts of current design toolkits in the form of cards were reviewed (refer to section 6.1.4).

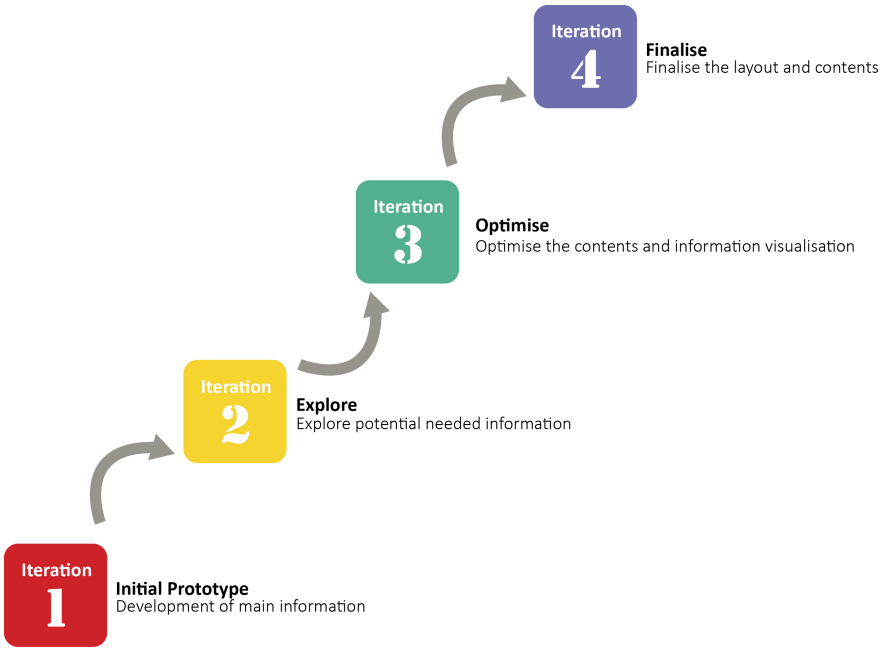


Figure 6.1 Iterations through expert interviews

In iterations of the workshops, designers including Eastern and Western cultural backgrounds were invited to use the card deck for designing Chinese cultural products. The aim of the workshops was to gain insight from designers regarding

graphic design, contents, and usability of the card deck. Each workshop included two sessions with one session conducted without using the card deck and the other one was with card deck. In comparison of the two sessions in each workshop, the card deck was tested to see whether it could help designers to enhance emotional links between consumers and products. Additionally, designers' insights regarding the criteria of the three folds, which are content, layout, and usability, were gained to improve the card deck.

6.1.1. Iteration One: Initial Prototype

A cultural feature was presented by its original images along with its descriptions. The scheme of some cultural features such as architecture or traditional objects was presented in a clear outline. The images of sample Chinese cultural products were also provided to show how the cultural feature was applied on a product. Thus, in the first version of the card deck (Figure 6.2) information such as images, schemes, descriptions of the original cultural feature, and examples of Chinese cultural products was presented. Design features were placed at the right edge of the card for an easier index. Correlated positive and negative emotional descriptors were placed at the bottom of the card.

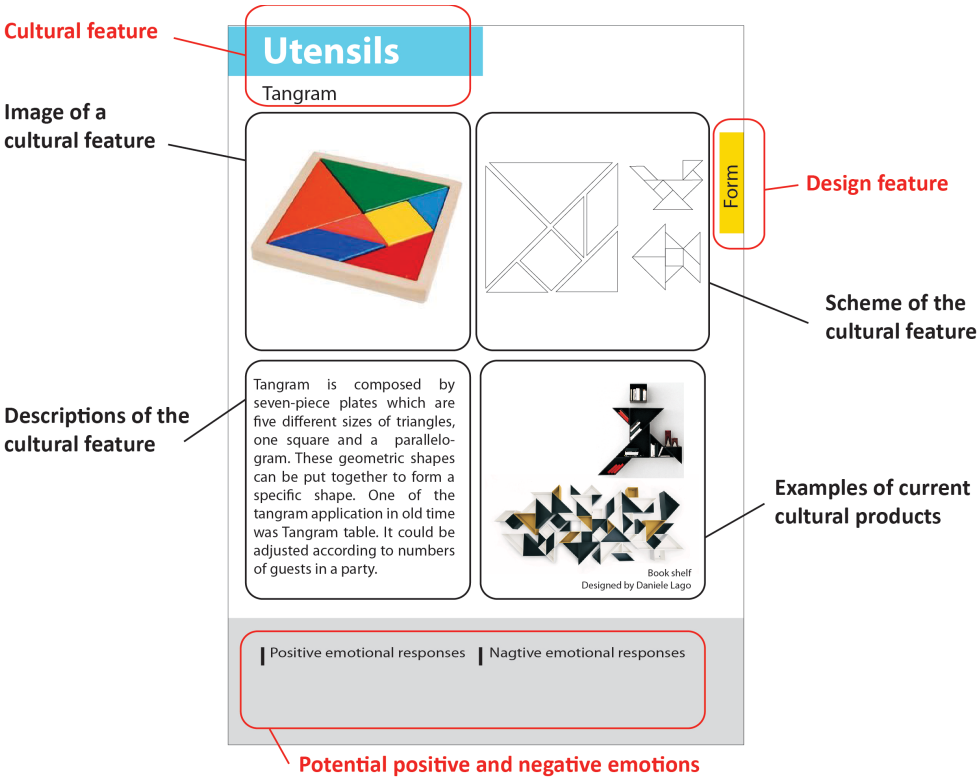


Figure 6.2 An example of the first iteration card deck

Feedback received from this iteration suggested that the main focus was on Chinese cultural features and correlated cultural products; however, information of emotional responses to the correlated cultural feature was not clearly specified. For example, the possibly positive or negative emotions, which were aroused from the Chinese cultural product, had to be specified. Therefore, it led to a second iteration.

Iteration 1

Initial Prototype
Development of main information

Experts' Feedback from iteration 1:
1) The emotional responses need to be clear
2) Emotional experience gained from material of a product is suggested to be considered.
3) Design process is recommended to be included.

Iteration 2

6.1.2. Iteration Two: Explore More Potentiality

In the second iteration of the card deck (Figure 6.3 and 6.4), design process was considered in the card deck by collecting cultural features, understanding the background of the cultural feature as well as retrieving and transforming design features. The design process section was placed at left of the card. On the right side of the card, images of Chinese cultural products, which aroused the same emotional responses, were presented, followed by other potential emotional experience at the bottom of the card. The Chinese cultural products, which aroused a specific emotional response, were highlighted. Design process was included to provide guidance from collecting and understanding cultural features to retrieving and transforming the features into products. However, feedback of this iteration suggested that the design process could be involved in a practical process than presented in the card. In addition some information provided was very repetitive which lost the focus.

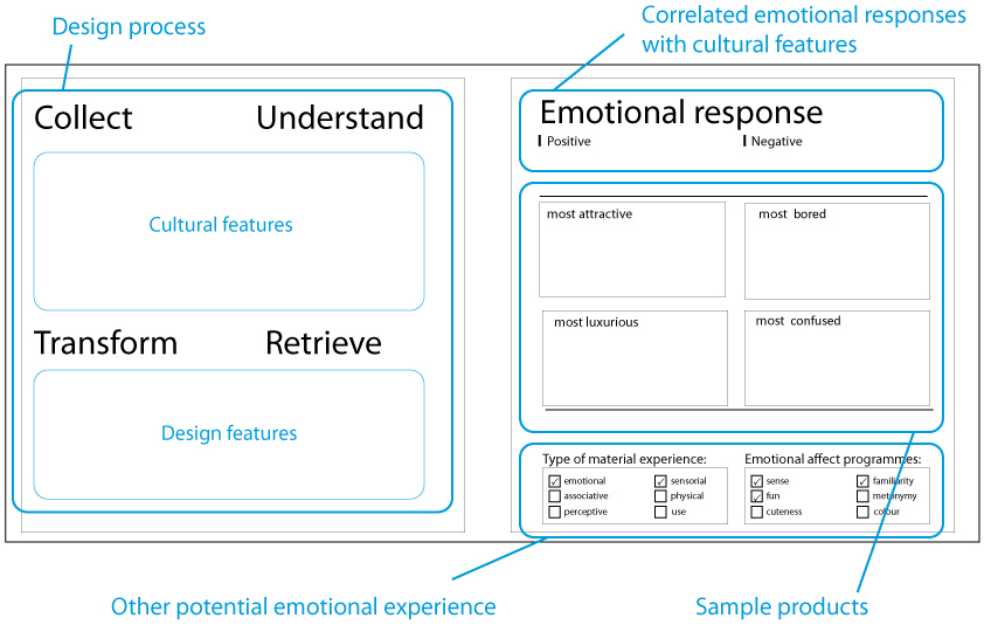


Figure 6.3 A framework of second iteration card deck

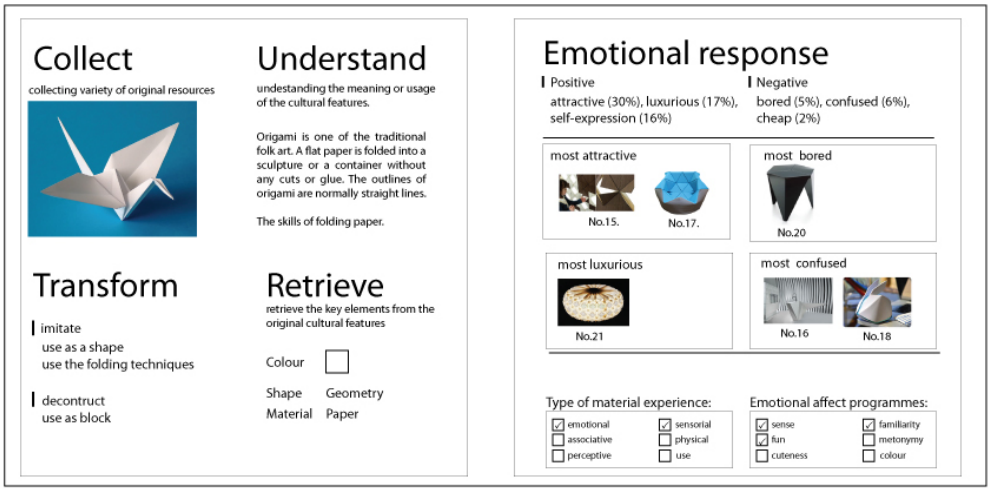


Figure 6.4 An example of the card deck.

Iteration 2

Explore
Explore potential needed information

Experts' Feedback from iteration 2:
1) Design process does not need to be highlighted in the card, but can be involved in the practical process.
2) Design features are suggested to be presented graphically.
3) Emotional responses from materials of a product may not be the focus of the card deck, so it is suggested to remove these.

Iteration 3

6.1.3. Iteration Three: Optimise the Contents

The third iteration (Figure 6.5) of the card deck attempted to present information more graphically and clearly. A cultural feature was presented by its outline. Nine design features defined in section 2.4 were all visually presented, but only ones which have been applied in current cultural products were highlighted with examples. A description of a cultural feature was placed at the bottom of left-hand side of the card. Detailed information of emotional responses including both positive and negative emotional responses aroused by the Chinese cultural products was provided. The information of how design features were adopted and possible reasons for these cultural products arousing particular positive and negative

emotional responses were stated below the sample products. Presenting outline of design features on the left hand side made the card look neat, but many repetitive images of products caused redundant information. Questions, which can inspire design thinking, were suggested (Lockton, et al, 2008). The emotion which was experienced the highest from a cultural feature was suggested to be highlighted.

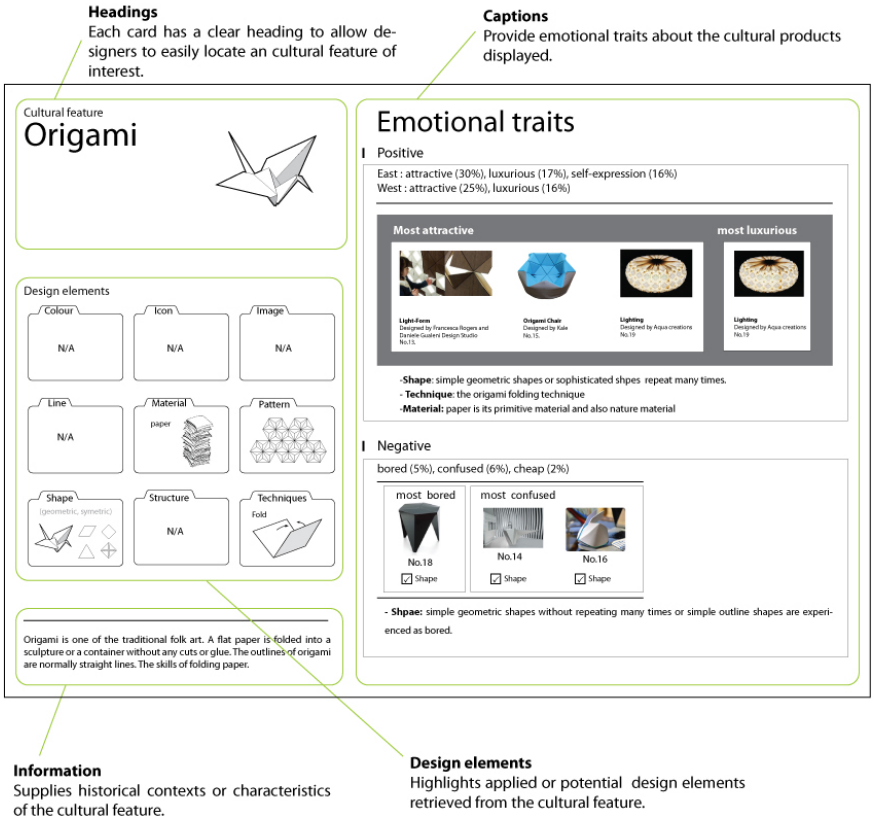


Figure 6.5 A framework and example of third version card deck

Iteration 3

Optimise
Optimise the contents and information visualisation

Experts' Feedback from iteration 3:
1) Questions which can inspire designers' thinking are suggested to create.
2) The emotional response which is highly correlated to a cultural feature is the one suggested to show in the card.
3) The design features, which are currently applied, are recommended to highlight.

Iteration 4

6.1.4. Layout of Card Decks and Iteration Four: Finalise

Layout

The layouts of current design toolkits in the form of card decks were reviewed and analysed. The templates of card decks were classified into two categories based on one-side or two-side cards (Figure 6.6). Examples of one-side card set are AT-ONE touch-point cards (Clatworthy, 2011), iD cards (Evans et al, 2010), Game seekers (Kultima et al, 2008), Inspiration cards (Halskov and Dalsgard, 2006), Design with Intent (Lockton, 2013), while examples of two-side card set are Biomimicry (Volstad and Boks, 2012) and IDEO method cards (IDEO, 2002)

These cards are mainly single side with both descriptions and images on the same side. Some cards provide questions to inspire ideas such as design with intent and game-seekers, while inspiration cards provide an empty box for users to fill in.

The advantage of one-side card is that all the information is presented straightforwardly. However, if the card contains much information to present, then one side card may cause information overload. The advantage of a two-side card is that an image can fill one side of the card, and contextual information can be on the other side, which allows users to focus on either photo or textual content at one time. This way is beneficial for users focusing one thing at a time and separation of images and contexts allows users to be inspired by images, and then read the context after understanding or interpreting the images.

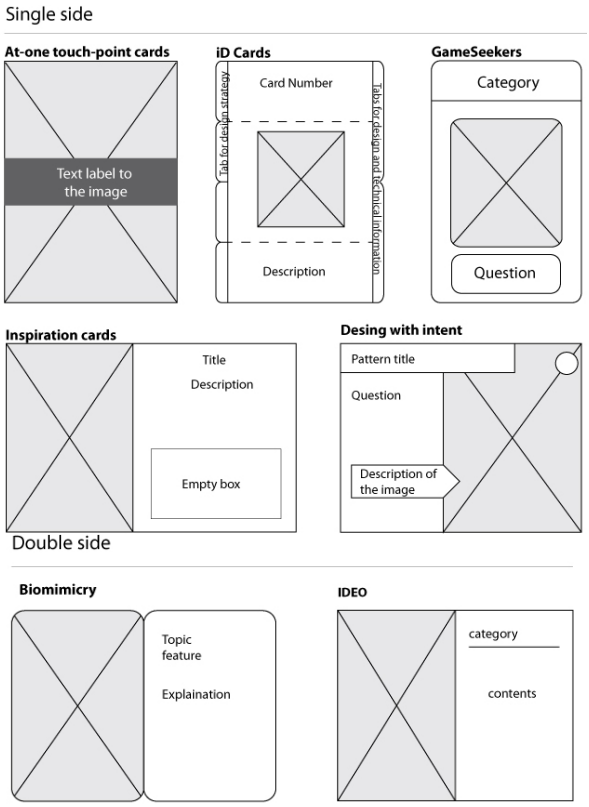


Figure 6.6 Layouts of card decks from other research divided by single side or double sides

Iteration Four

The final version of the card (Figure 6.7) deck attempted to highlight the emotional descriptor of every cultural feature. An example image of a cultural feature was presented along with its highly correlated emotional respond on one side. In addition, a question was placed in a cloud-shape dialog box to inspire designers to generate more concepts, because putting a question in a card would help to generate more ideas (Lockton, 2013). Furthermore, the results of the questionnaire showed that populations in different age ranges and cultural backgrounds perceived Chinese cultural products variously. Therefore, a potential age range of target users from Eastern or Western cultural backgrounds was listed at the bottom of the same side of card. On the other side of the card, a description of a cultural feature was presented and the applied design features in the category of cultural feature were highlighted, followed by source of example products.

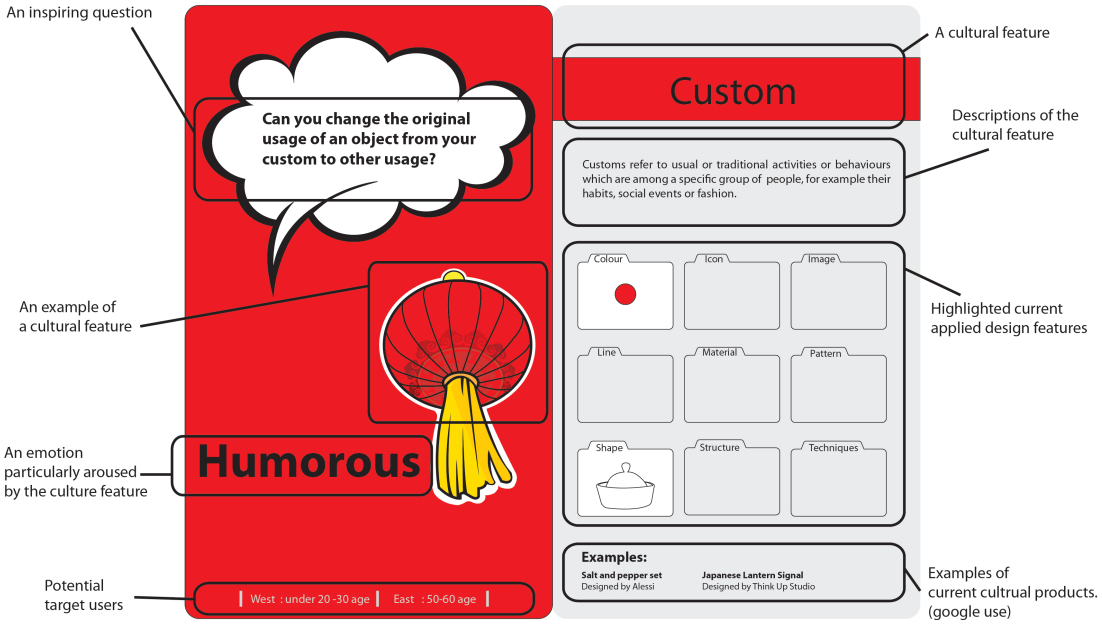


Figure 6.7 A layout and example of final version card deck (front / back)

Feedback of the final iteration was received regarding the criteria as contents and layout, and usability. Regarding contents, the inspirational questions on the card were very well expressed and easily understood; the pictorial and textual contents of the cultural features were very well understood; the design features were very helpful in the idea generating process. In general, the card deck provided the information they needed in the design process. Regarding layout, Positive feedback was received according to the layout, colours and readability of the card deck. In addition, the font size of example section needed to be larger.

The card deck for this research was expected to provide information about cultural features, design features, description of the cultural features, emotional descriptors, target users, examples of related cultural products as well as a question to inspire designers generating more concepts. Considering the amount of information, it is more suitable to arrange on a two-sided card. In addition, cultural features and their correlated emotional descriptors are the main two variables which are on a different side for users to choose one of them according to their design purpose. Designers

can either select a certain cultural feature to initiate their design and consider the possible aroused emotional responses or select potential emotional responses that they expect and select a culture feature in their design. Therefore, the layout adopted in the card deck of this research is a set of two-sided cards.

6.2. Validation of the Toolkit

Validation of the toolkit is an important step of the design research process (see section 4.5.5) to evaluate whether the toolkit is properly made to use as intended. A popular evaluation of toolkits is in a form of workshops, which have been adopted in many design studies for idea generation and for testing an inspirational tool practically (Lockton, 2013). The target of the workshop in this research is to evaluate whether the toolkit can assist designers to increase emotional engagement of their cultural products. The information provided by the card deck is also evaluated by the designers in the workshops in order to better fit the designers' needs. The developing process of the toolkit is illustrated in Figure 6.8. Experts' interviews were done from iteration 1 to 4. In this section, the toolkit is going to be validated by the iteration 5 and 6 in a form of workshops. Then the final design is accomplished based on the feedback from the workshops.

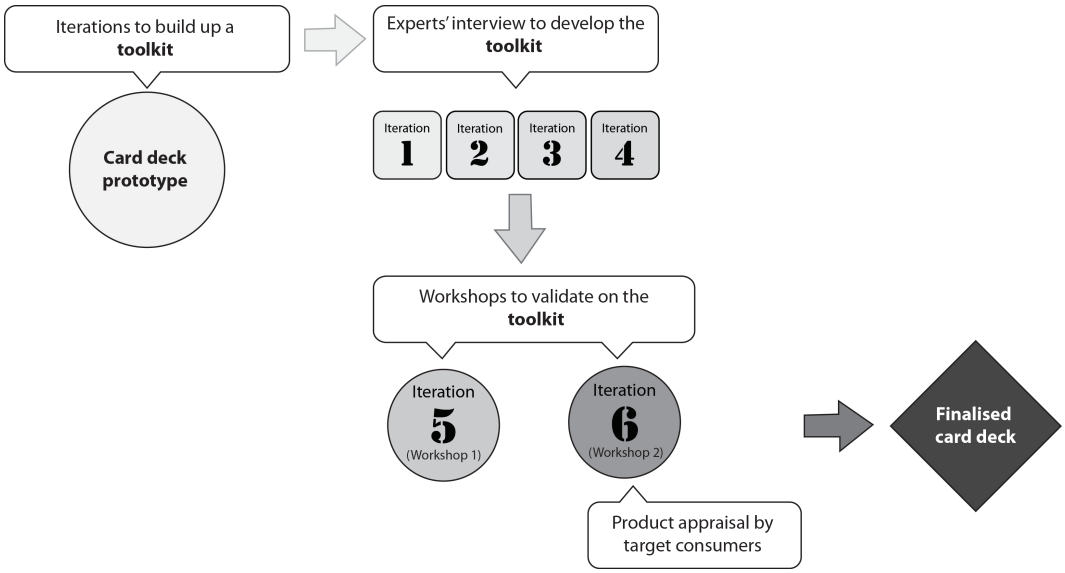


Figure 6.8 The developing process of the toolkit

6.2.1. Workshop One (Iteration Five)

The aim of this workshop was to test if the contents, layout, and usability of the card deck could meet the designers' needs in the idea generating process. Thus, two sessions of the workshop challenge designers to create different products in the office use context. Participants were nine designers with four designers from an Eastern cultural background and five from a Western cultural background. The participants were maily recruited from students who were interested in participating in the project and they were in the department of design in Brunel University including undergraduate, postgraduate, and PhD levels. The recruitment was also open for experienced designers who work in the industry. The participants were all design professionals and had experience of product design. They were grouped in three where one for all Eastern designers, another for all Western designers, and the other for a mixture of both Eastern and Western designers. In total, 9 designers with different cultural backgrounds were recruited. Therefore, they are grouped in three with one group involving three Eastern designers (group A), the second one involving three Western designers (group B), and the third one involving one Eastern and two Western designers (group C). Regarding the genders, five designers are female and four designers are male. Also, each group has a facilitator in the workshop.

The workshop was divided into three sessions, as shown in Figure 6.18: session one is conducted without the card deck, session two is conducted with the card deck, and session three involves the evaluation of the products designed in the previous two sessions. The first two sessions comprise the same target and criteria as well as activities, which include two phases: ideation and sketch (Figure 6.9 & 6.10).

In the beginning of the workshop, an introduction of current Chinese cultural products is presented to the participants. Then designers are given a task to design a product for office use which would be sold at a shop where the customers including international visitors. They are guided that their products have to meet the criteria in three folds: emotional connection, cultural representative, and function. 'Emotional connection' means the product should engage their users whose age

between 20 and 50, working in the office. 'Culturally representative' means the cultural feature of the product should be well recognized. 'Function' means the product should be useful. Designers are given two sheets, which are workshop instruction (Figure 6.9) and final sketch template (Figure 6.10).

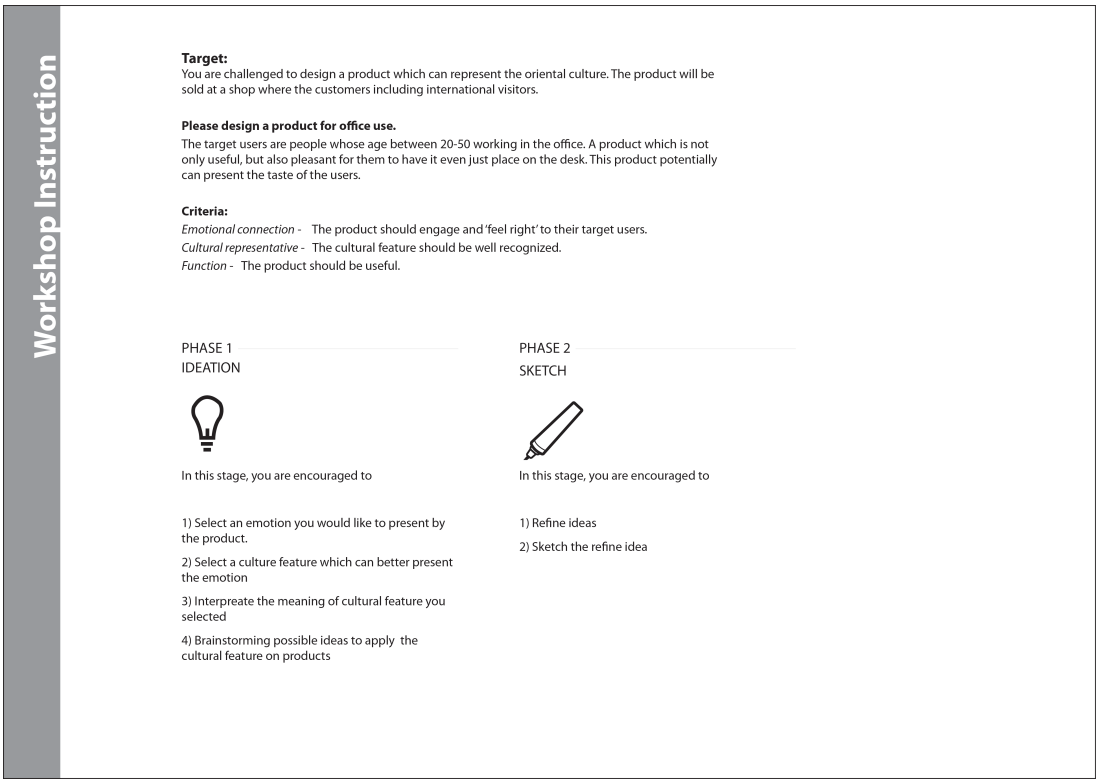


Figure 6.9 The workshop instruction (session 1)

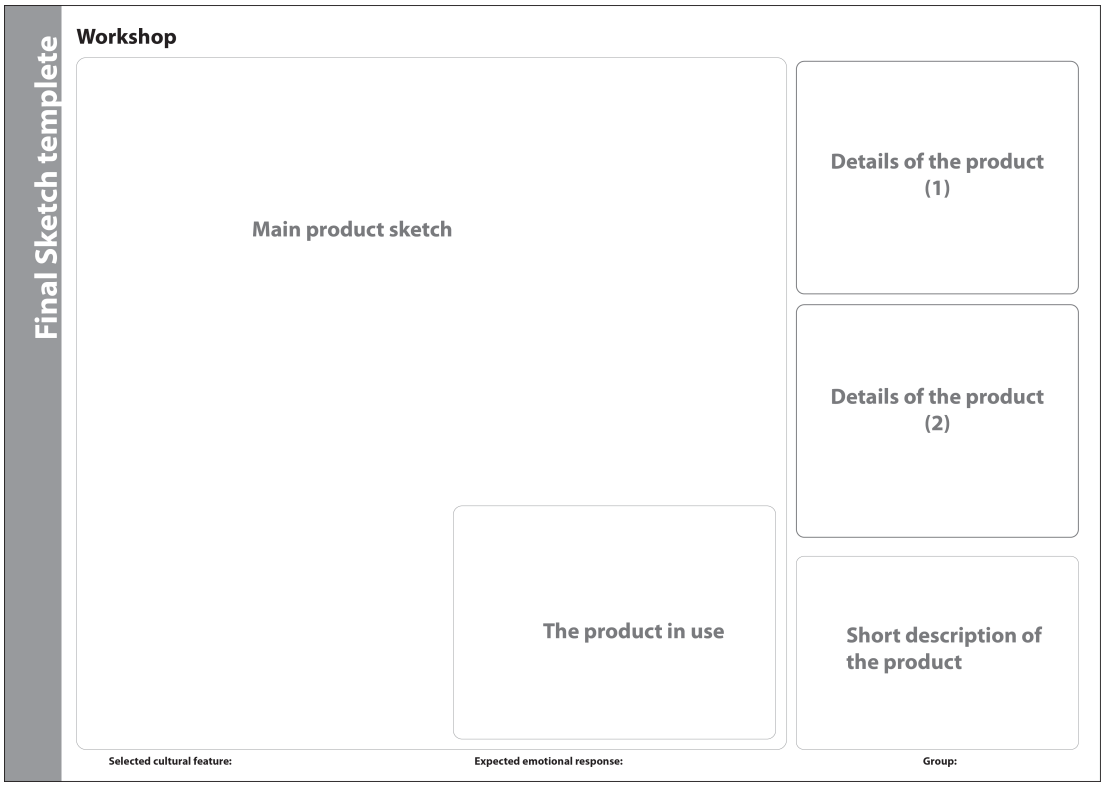


Figure 6.10 The workshop sketch template (session 1)

In the phase 1 – ideation, designers are challenged to generate ideas of creating a Chinese cultural product in a brainstorming in 20 minutes. In the phase 2 – sketch: designers select one idea from the brainstorming to develop a product sketch in 10 minutes. Designers will target at an emotional experience that they expect their product to deliver. The emotional experience is expected to fit well with a cultural feature in order to let users interpreting the meaning of the product. Designers are free to choose an emotional experience and a cultural feature they would like to design for a product for office use. Figure 6.11 is a sketch from group A. Their target emotional experience is stress releasing and amusing and the cultural feature they select is a traditional Chinese drum. The product for office use is a cup holder. The sketch of group B is shown in Figure 6.12. The emotional experience targets at pride and the product is a marble stamp. The group B is inspired from a traditional Chinese stamp. An official marble stamp is designed as a pen-shape that can be placed on an office desk to show the owner's pride and social status. Figure 6.13 is a sketch from

group C. The designers target at self-expression as the emotional experience and the product is a business card holder. They are inspired from Bonsai, which is a dwarfed ornamental tree grown in a shallow pot.

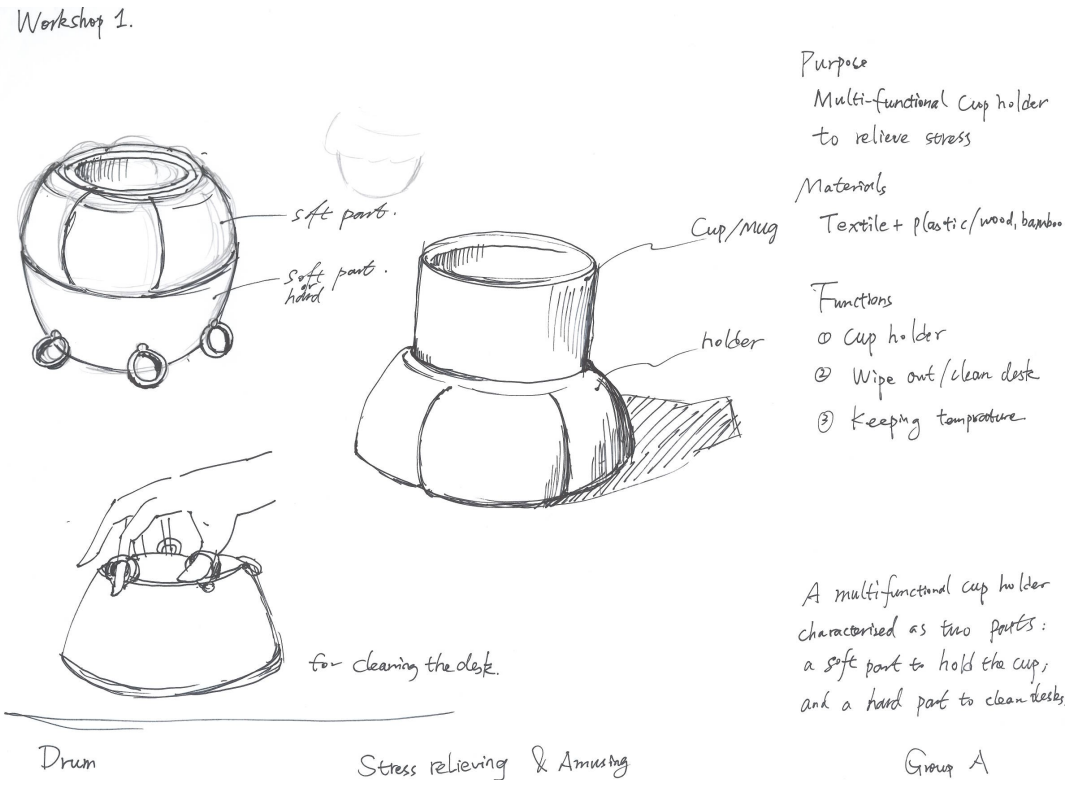


Figure 6.11 A sketch of session one: a cup colder from group A

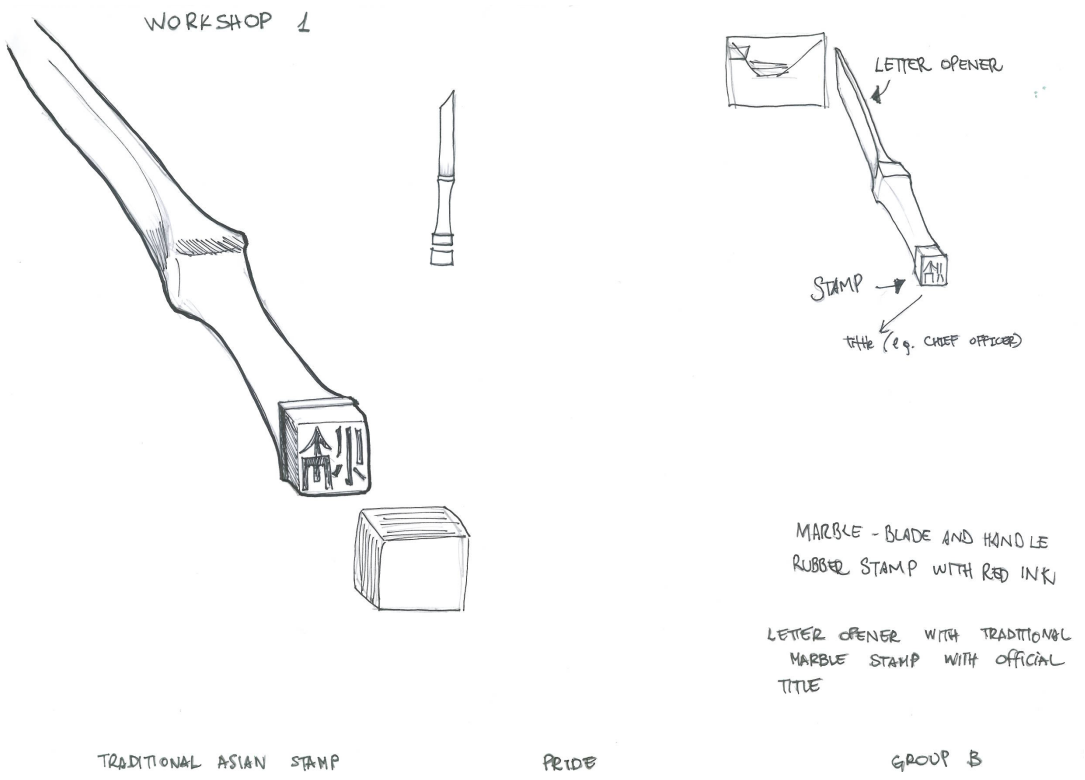


Figure 6.12 A sketch of session one: a marble stamp from group B

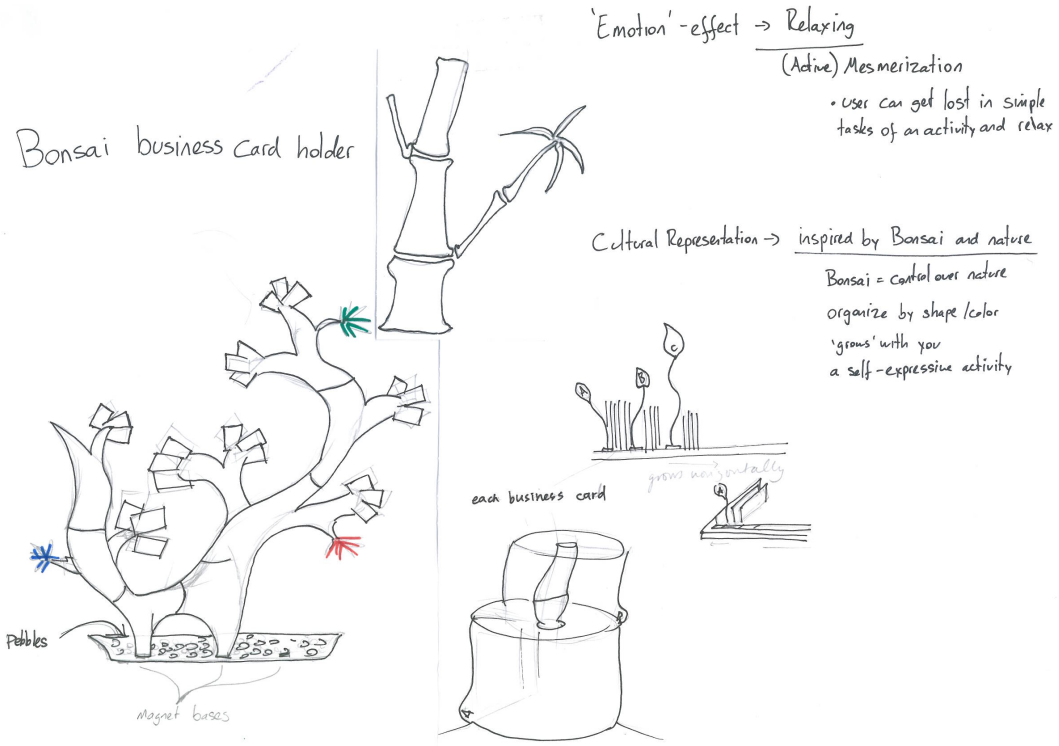


Figure 6.13 A sketch of session one: a business card holder from group C

In the session two, designers follow the same procedure as session 1: ideation and sketch, but the card deck is introduced to the designers in order to assist designers in their idea generating process. A workshop instruction for session 2, shown in Figure 6.14, is also provided to guide designers using the card deck. In this session, designers are encouraged to use the same emotional experience as an example to design product, so that we can compare the difference between groups. After a short discussion, 'humorous' is selected as the target of emotional experience. Therefore, the cards of 'humorous' category are picked up and on the other side of the card it will show what cultural features are highly possible elicit the emotional experience 'humorous'. Therefore, designers have the information to decide a cultural feature they would like to use and what type of design features can support them to deliver the emotional experience.

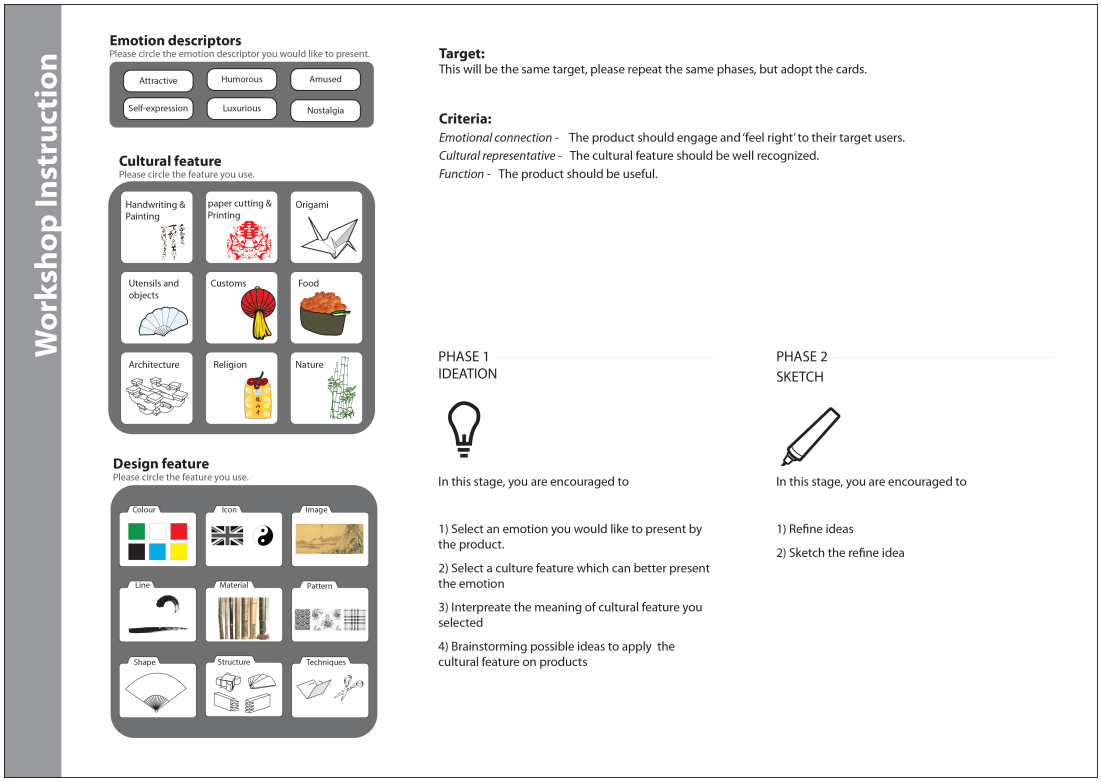


Figure 6.14 The workshop instruction (session 2)

In session 2, designers in group A select 'food' as a cultural feature to design a product for office use. The selected idea to sketch is a dumpling-shape pillow, as shown in Figure 6.15. Designers in group B select 'custom' as the cultural feature

and a brush from the Chinese custom is chosen for their design. Designers in group B use a Chinese brush to design a pen, which can write on a technology device for customization. Designers in group C choose 'architecture' to be the cultural feature on the product. They design an architecture shape gate and through the gate people can take their key.

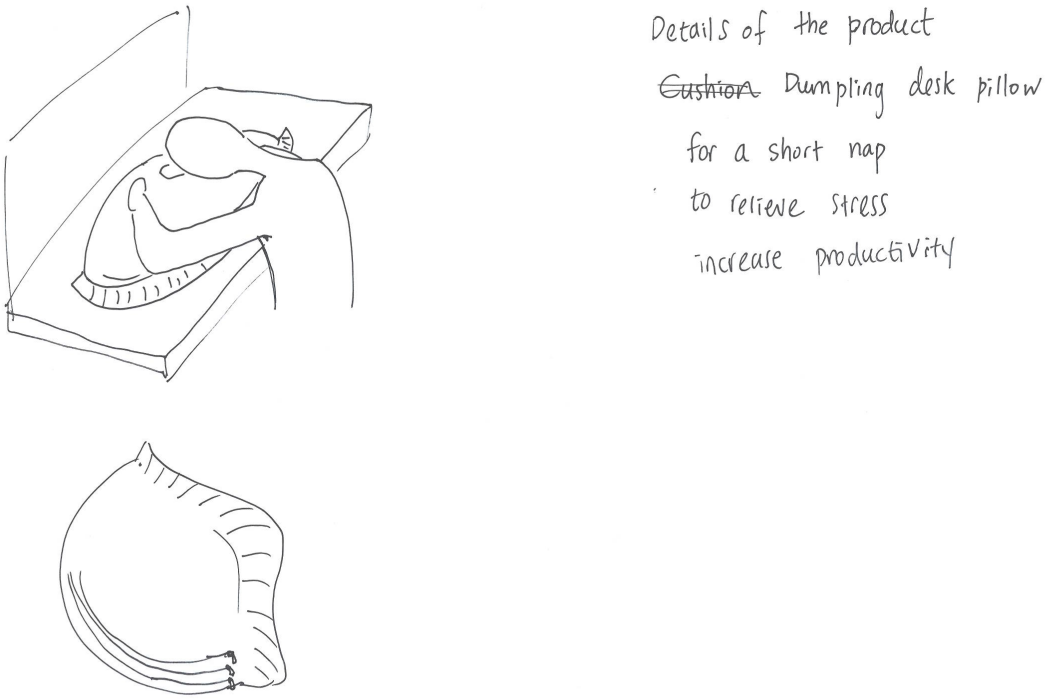


Figure 6.15 Session2: A dumpling-shape pillow from group A

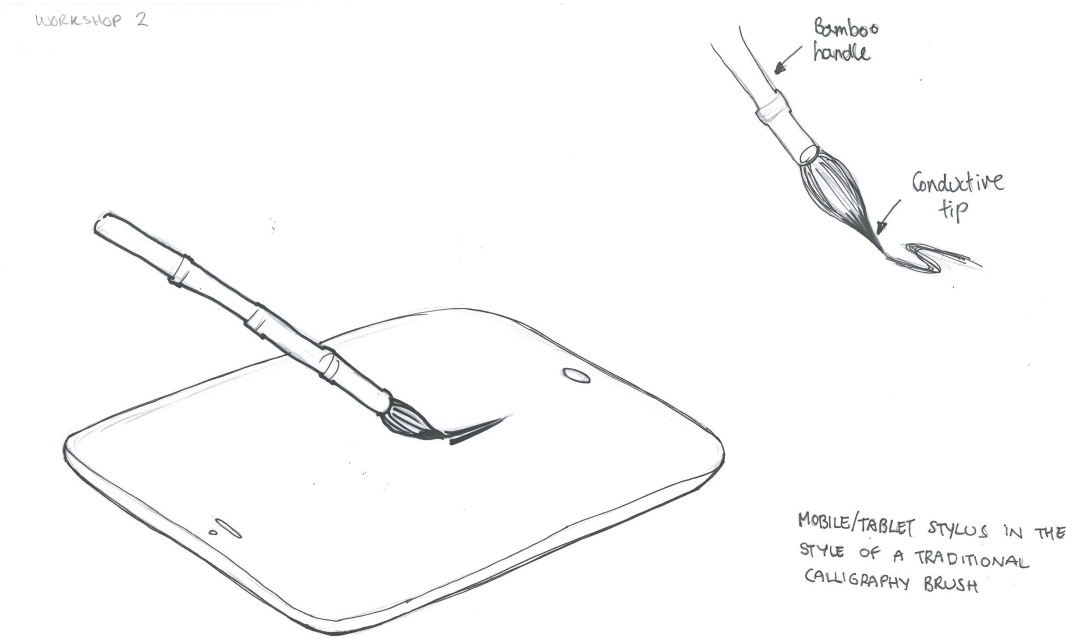


Figure 6.16 Session2: A Chinese brush designed for writing on a technology device from group B

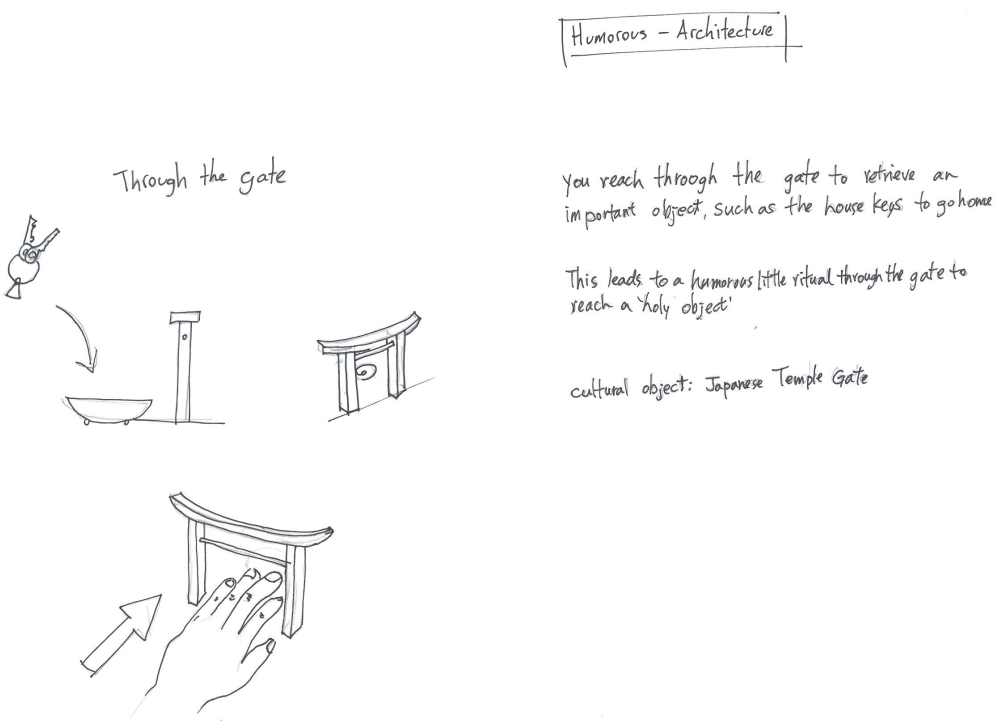


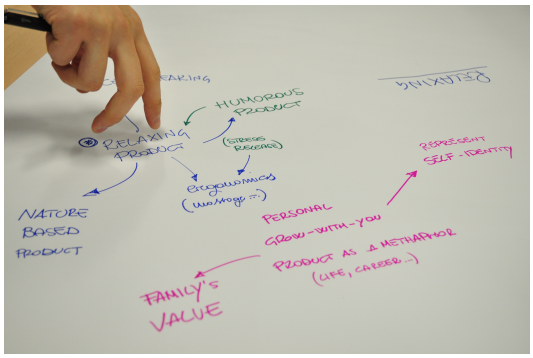
Figure 6.17 Session2: An architectural gate for key holder from group C

The only difference of the first two sessions is that designers are not provided the card deck in the first session, while in the second session the card deck was introduced to assist participants in their idea generating process. Both sessions include brainstorming to generate their design ideas. The ideas are then refined into a clear objective for sketching. Finally, the idea sketches of both sessions in every group are presented and voted visually with dotmocracy. Dotmocracy is a method, which is used to vote with dot stickers on idea rating sheets. Participants are given limited dot stickers to paste on their favourite options. This method is helpful for finding agreement among many options in a group (Stevens, 2014).

Participants were provided with ten dot stickers to vote for the products according to the criteria. In addition, KJ technique is employed to externalize designers' opinions of using the card deck in order to get the insights and feedback from the designers. KJ technique is conducted in silence where participants are provided sticky notes and markers to write down as many as their thoughts of the issue (Martin and Hanington, 2012), and then after everyone's notes are equally presented, the author can organize their problems, suggestions, needs and concerns of the card deck for the next step improvement. In the final part of the workshop, products sketches are evaluated by the designers. Additionally, designers provide their feedback via KJ technique regarding the experience of adopting the card deck in their design process. A questionnaire of evaluating the layout, content, and usability of the card deck was conducted. The results of the questionnaire will contribute to the improvement of the cards. More details of the results of evaluation are in the section 6.2.2. The plan of the workshop activities and participant consent form are in the appendix.

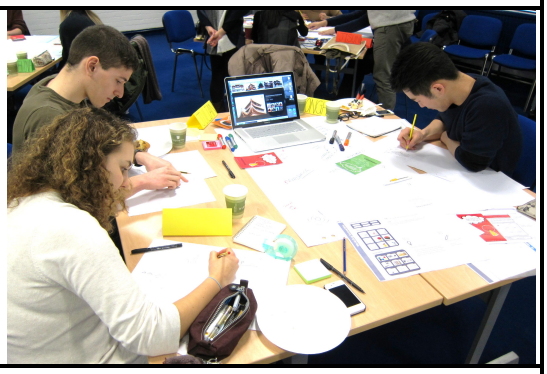
Workshop 1- session 1: Idea Generation 1

Designers were encouraged to generate ideas of Chinese cultural products in a brainstorming. In this session, the card deck was not introduced.



Workshop 1- session 2: Idea Generation 2

Designers were encouraged to generate ideas of Chinese cultural products involving the card deck in a brainstorming.



Workshop 1- session 3: Evaluation

The concept of Chinese cultural products were rated by dots regarding the criteria: emotional connection, cultural representative and function. Feedback from designers would be used to improve the card deck.

Figure 6.18 The first workshop

6.2.2. Evaluation of the Products

The session 3 of the workshop is an evaluation of the products designed in the previous two sessions as well as an evaluation of the card deck. The criteria of rating

the cultural product sketches were 'emotional connection', 'cultural representative', and 'function'. Every group gave a short presentation of their product design concepts, followed by an evaluation with dotmocracy. Firstly, designers of every group presented their product concepts, which were designed without the card deck in the session one. Designers were given 10 green dots to evaluate the products sketched by the other two groups. After the first evaluation with dotmocracy was done, and then designers presented their concepts of second product sketches, which were generated with the assistance of the card deck. After second presentation, designers were given 10 yellow dots to evaluate the products by the same criteria. As a result shown in Figure 6.19, the green dots represented the rating of the concepts which were generated without the card deck, while the yellow dots represented the rating of the concepts which were generated involving the card deck.

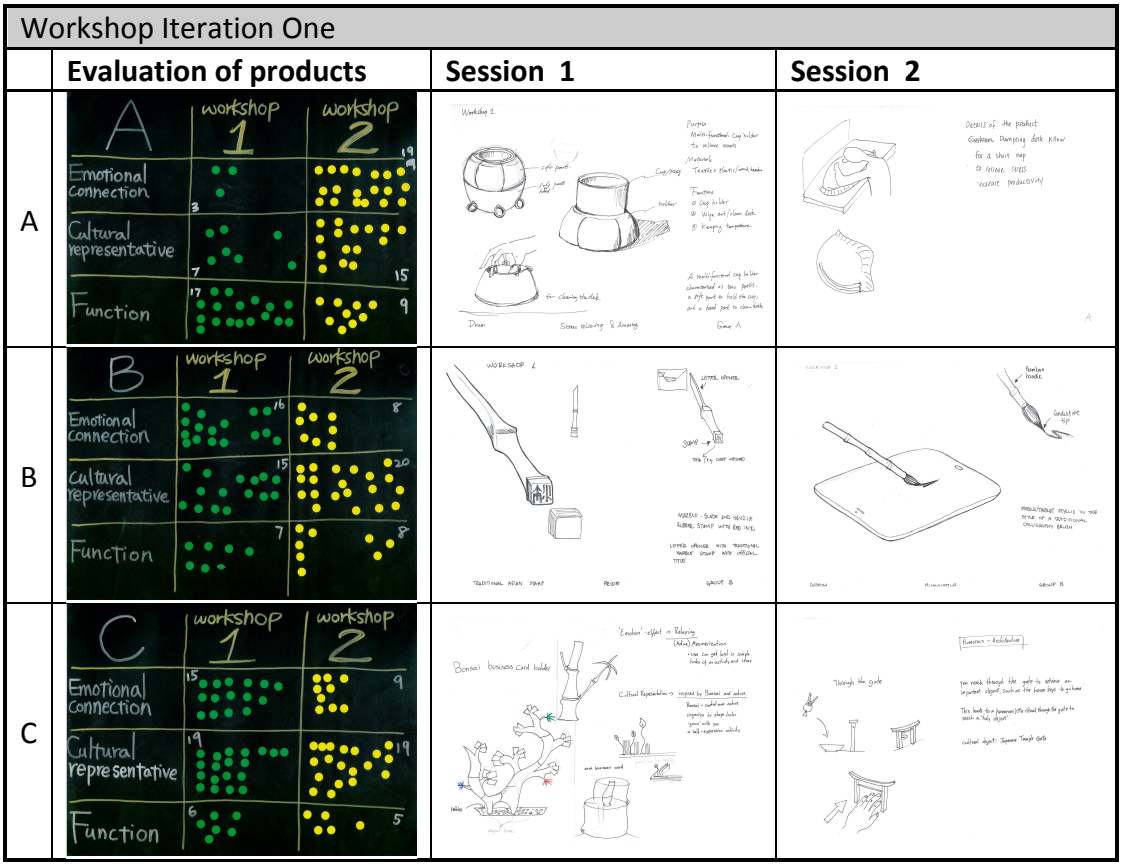


Figure 6.19 Workshop iteration one/ results

The increase and decrease of the rating regarding the criteria in the groups are presented in Table 6.1. For the criterion of emotional connection in the first two

sessions, the rating of the product concepts from group A increased from 3 dots to 19 dots after using the card deck, but it decreased in group B (from 16 dots to 8 dots) and group C (from 15 dots to 9 dots). This might because in the workshop session one designers could select any emotion correlated to a cultural feature based on their underlying experiences, and western designers felt free to select a cultural feature, which was familiar to them. However, in the second session when they had to use the cultural features which were correlated with the emotional experience selected, they felt limited to the cultural features which might not familiar to them. This resulted in western designers could make better emotional connections in the first session. Eastern designers were familiar with the Chinese cultural context and, therefore, after using the card deck their product concepts could make a better emotional connection. This might because Eastern designers have a better understand of the cultural features, and thus when they got inspired by the cards, it was easier for them to connect the emotions correlated to the cultural feature.

For the criterion of cultural representative, the rating in both group A (from 7 to 15 dots) and B (from 15 to 20 dots) was increased and it remained the same in group C (19 dots). This result suggested that the card deck help designers to select a suitable cultural feature.

The card deck supported designers in the group B and C to select suitable cultural features. However, it is more difficult for designers in the group B and C to relate emotional experiences to the selected cultural feature. Thus, the card deck needed to improve the links between cultural features and correlated emotion experiences in order to assist designers who are not in the Chinese cultural background.

Table 6.1 The increase and decrease of the rating among three groups regarding the criteria

Designers / Criteria	Group A	Group B	Group C
Emotional connection	↑	↓	↓
Cultural representative	↑	↑	=
Function	↓	↑	↓

6.2.3. Feedback on the Card Deck - Questionnaire

The questionnaire for the feedback included three parts which were graphic design, contents and usability. The questions under each category were listed in Table 6.2.

Table 6.2 The criteria of the card deck evaluated in the questionnaire

1) Graphic design	1-1 Layout
	1-2 Colours
	1-3 Size of the cards
	1-4 Readability
2) Contents	2-1 Clarity of the questions on the cards
	2-2 Understandability about the pictorial and textual content of cultural features
	2-3 Highlighted design features help to inspire your ideas
	2-4 The cards provide the information you need
	2-5 The cards help to generate *more* concepts according to correlated emotional descriptors
	2-6 Your experience of adapting the cards into your design
3) Usability	3-1 It is easy for you to adapt the card into your design
	3-2 It can help you to generate concepts quickly.
	3-3 It is effective when using the cards in your design.
	3-4 It is pleasant experience when using the cards.
	3-5 The cards meet your expectation.

The result of questionnaire showed that both Eastern and Western designers rated the card deck very high as 4.1 points were scored on average within all designers

(Figure 6.20). For the individual criteria, the card deck was evaluated average 4.1 in graphic design, 4.1 in its presented contents and 4.2 in the usability. Likert 5-point scale was adopted in this questionnaire; 5 is excellent, 4 is good, 3 is neutral, 2 is poor and 1 is very poor. The card deck was ranked high and only three questions, which are 2-1, 3-1 and 3-5, were ranked below 4 points. Therefore, the questions on the card needed to be reconsidered, the ease of use of the card deck had to be improved, and interviews of some participants were required to know what part to improve to meet their expectations.

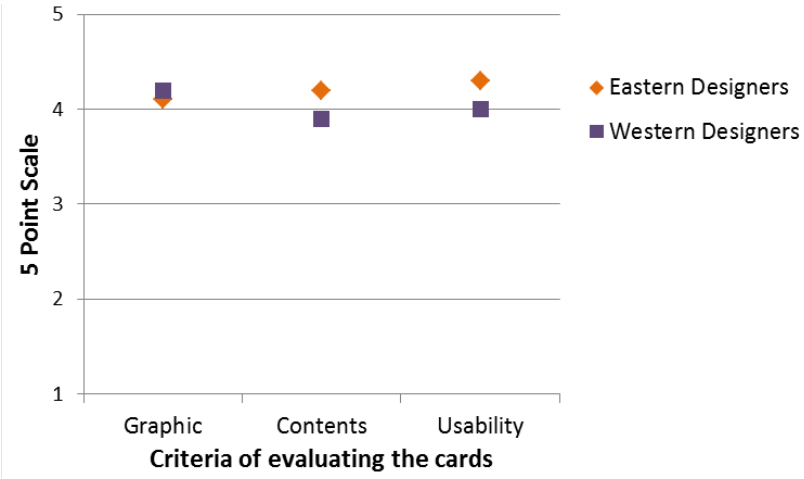


Figure 6.20 The evaluation of the card deck from workshop iteration one

Overall, participants gave positive feedback on using the card deck in their design process. The card deck was very helpful in selecting and organizing ideas and was considered as a more efficient approach to be involved in the design process to explore more concepts. The information provided could help designers to focus and to create a necessary boundary. It was regarded as an interesting experience to generate more ideas with cards. In addition, one designer suggested that cards would work much better if adapted in the process of refining the ideas from brainstorming in order to gain the deeper thinking with quantity of ideas and inspiration.

There were also some suggestions to improve the card deck. One designer suggested that and the font of examples should have been bigger. Some of the inspirational questions were clear but some were confused and hard to relate. Regarding emotional descriptors, 'humorous' and 'amused' could be identified more clearly. The design features in each card were recommended to be filled with more examples. The feedback contributed to improve the card deck for iteration six.

Discussion

During workshop sessions, participants gave very positive feedback about using the card deck and the layout of the card deck was well designed and suitable for group use. The card deck worked very well in selecting cultural features for all groups; however, the link between cultural features and the correlated emotions was not strong enough to assist designers who are not in the Chinese cultural background to use the cards.

The feedback obtained from the second session using the card deck was that Eastern designers produced ideas more efficiently and more productively, but the card deck made Western designers feeling restricted in the brainstorming process.

The results from the workshop were useful to improve the card deck based on feedback received from the designers. The questions on the card did not relate well with a cultural feature and its emotional descriptors, thus the inspirational questions were removed. Clear definitions of emotional descriptors needed to be provided; the design features, which have been applied to make a Chinese cultural product in each category, had to be enlarged; the images of sample products had to be presented.

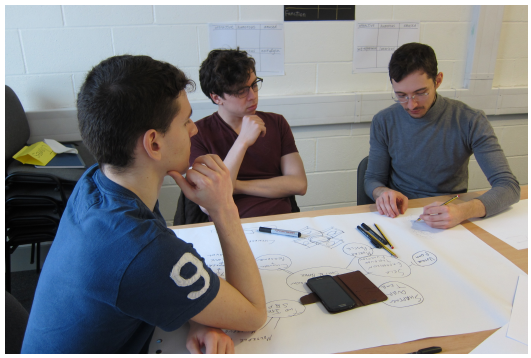
The directions taken in development were mainly driven by insights from iterative workshops using the card deck. In the second workshop, the toolkit would play an assisting role rather than leading the brainstorming process. The task of the second workshop would challenge Easter and Western designers with the same products to test if the cards help them in the idea generation process.

6.2.4. Workshop Two (Iteration Six)

The second workshop aimed to test if the improved cards assisted designers better in their design process. This workshop followed the same procedure as the workshop iteration one, but the target was fixed to design a product (i.e. salt and pepper set) and the emotional experiences had to be selected from one of the six descriptors: attractive, humorous, amused, self-expression, luxurious, and nostalgia. This limitation would help to compare the results of designing without the cards (session 1) and with the cards (session 2). The designers were mainly recruited from department of design in Brunel University and also open for designers who work in the industry. The aim was to recruit three designers from Eastern cultural background and three designers from Western cultural background. The designers recruited for this workshop were experienced designers or design researchers. They were then grouped in two in relation to their cultural background. Group A was composed by three Eastern designers and group B was constituted by three Western designers (Figure 6.21).

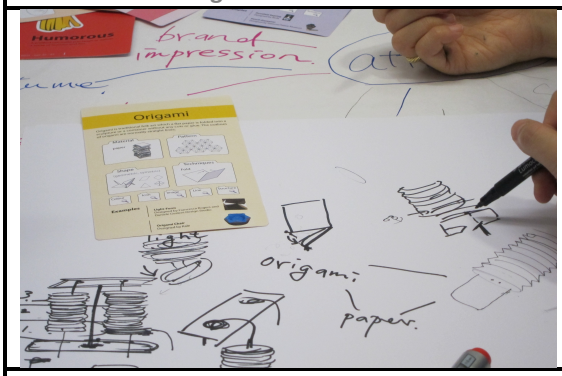
Second workshop - session 1: Idea Generation 1

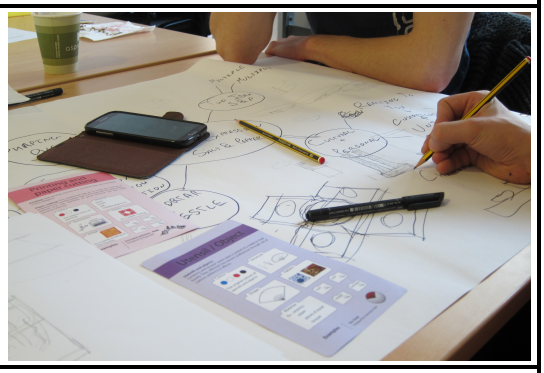
Designers were encouraged to generate ideas of Chinese cultural product in a brainstorming. In this session, the card deck was not introduced.



Second workshop - session 2: Idea Generation 2

Designers were encouraged to generate ideas of Chinese cultural product involving the card deck in a brainstorming.





Workshop 2- session 3: Evaluation

The concepts of Chinese cultural products were rated by dots regarding the criteria: emotional connection, cultural representative and function. Feedback from designers would be used to improve the card deck.

Figure 6.21 The second workshop

Designers were challenged to design a salt and pepper set, which can present Chinese culture. They selected a cultural feature which would be suitable for the product and the product can elicit some certain emotional experiences with the

users. In the session one of the workshop two, designers were given 20 minutes for brainstorming and generating as many ideas as possible. They would select a suitable cultural feature based on their underlying experiences. In the next 10 minutes, they selected one of the ideas to sketch on an A3 printing paper. Designers of group A selected a teapot as a Chinese cultural feature to design a salt and pepper set. They aimed to make the product 'attractive'. The final sketch of group A is shown in Figure 6.22. The salt and pepper set is inspired from a teapot, but inside the teapot are two spaces for salt and pepper.

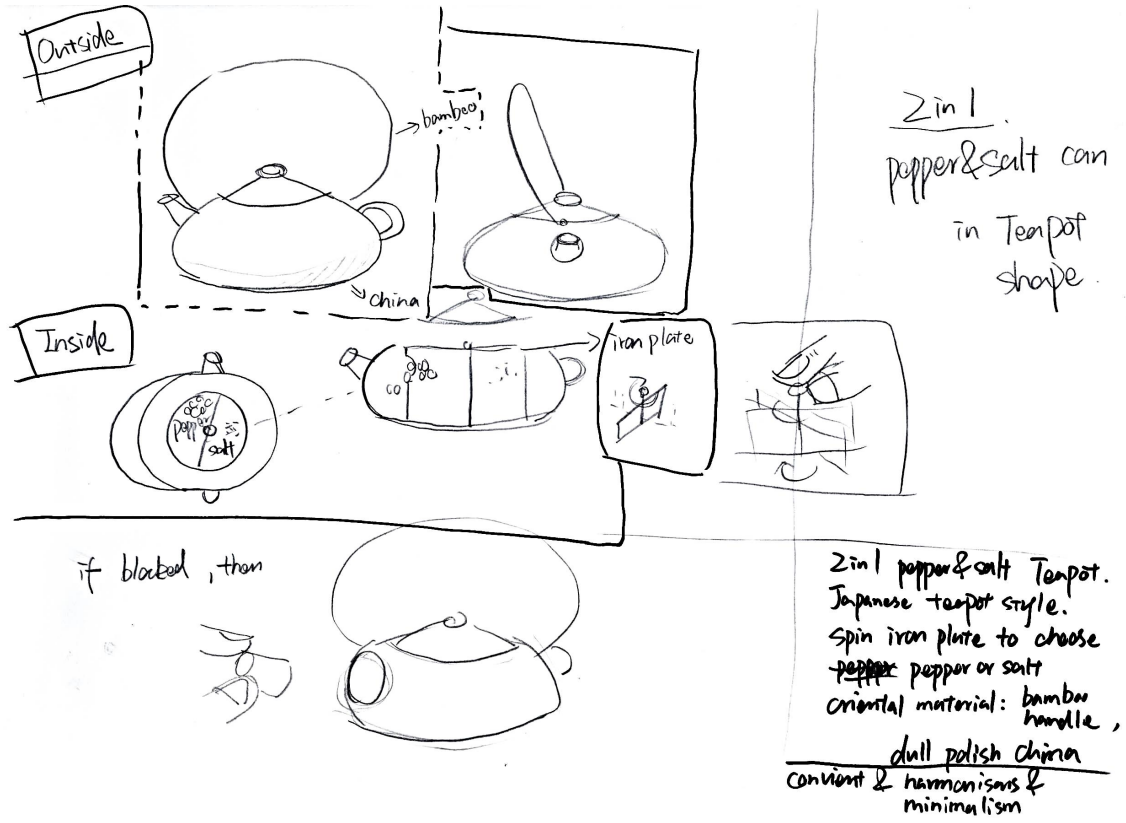


Figure 6.22 The salt and pepper set from Group A

The product sketch of group B, as shown in Figure 6.23, is inspired from a Zen garden. They aimed to make the product showing the owners' 'self-expression'. The way salt and pepper shown in the container is like sands presented in a Zen garden.

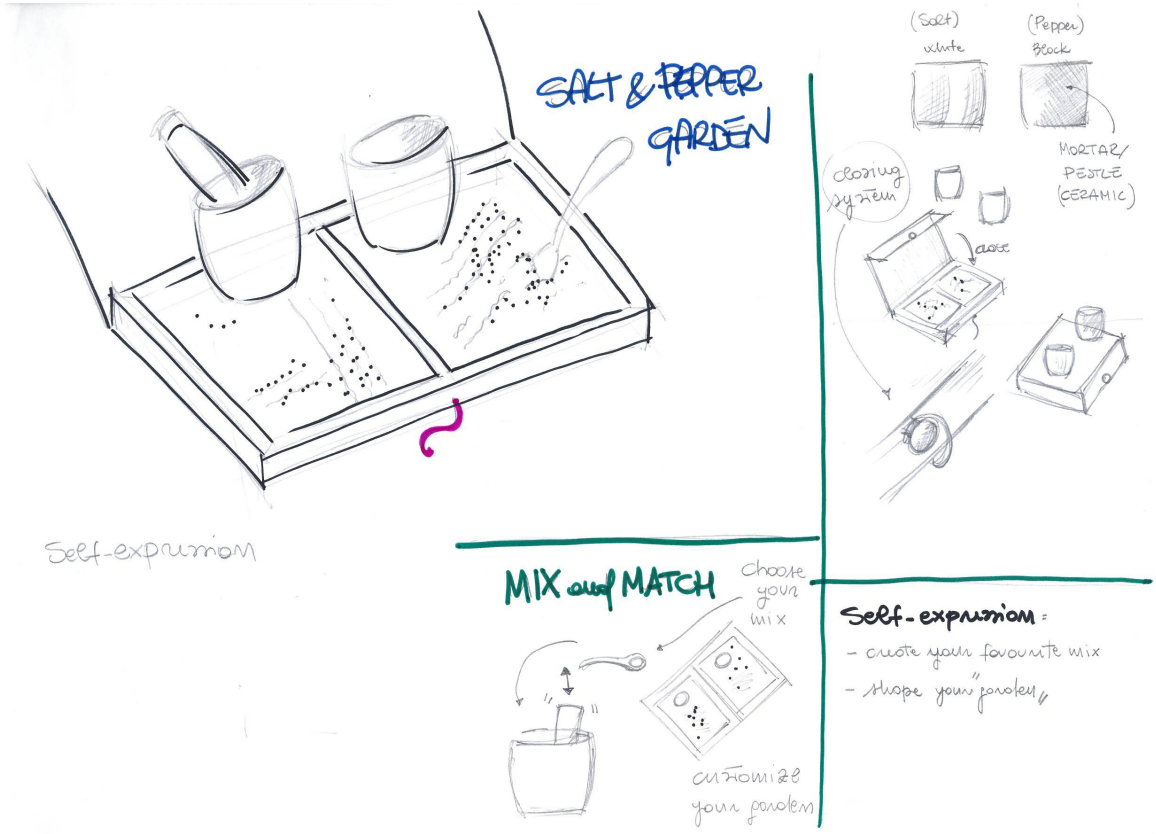


Figure 6.23 The salt and pepper set from Group B

6.2.5. Evaluation of the Products

The criteria of the products remained the same as emotional connection, cultural representative and function, however, the emotional connection specifically referred to whether the product aroused the emotion that designers aimed for. In addition, a sheet of the six emotional descriptors was provided to evaluate whether the product aroused other emotional responses. Designers of group A chose 'attractive' emotional descriptor and group B chose 'self-expression' for their products.

The products of group A (Figure 6.24) were evaluated by designers of group B. The evaluation of group A showed that the emotional connection was improved from two dots to seven dots after involving the card deck. Cultural representative remained the same rating. The function wise was slightly decreased from six dots to four dots. Eastern designers aimed to design 'attractive' salt and pepper sets, and each product also aroused other emotions as shown below the product sketch.

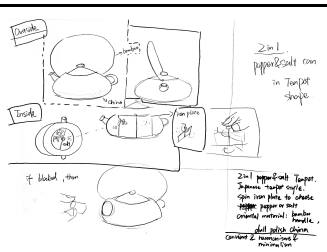
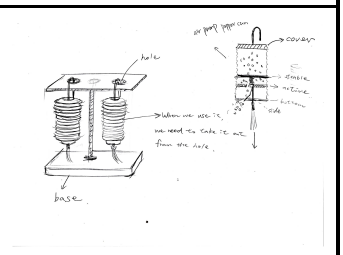
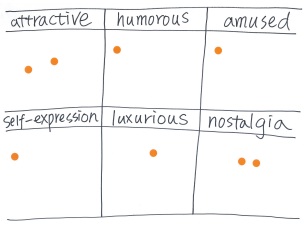
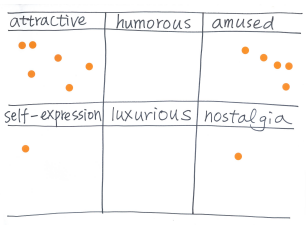
Second Workshop			
Evaluation of products		Session 1	Session 2
A			
	Additional emotional responses		

Figure 6.24 The evaluation of product sketches (designed by Eastern designers)

In the evaluation of group B (Figure 6.25), the rating of emotional connection remained the same, rating of cultural representative decreased from seven points to three points, and rating of the function increased from zero to five. Other emotional responses of the same product were shown below the sketches.

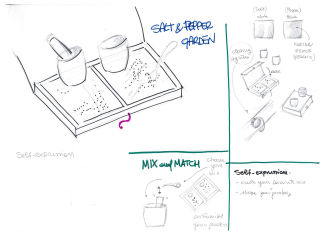
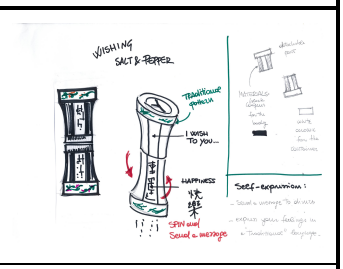
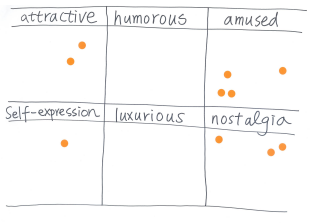
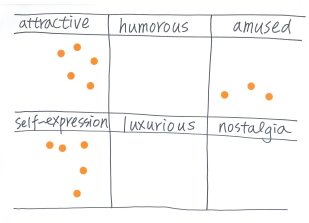
Workshop iteration two			
Evaluation of products		Session 1	Session 2
B			
	Additional emotional responses		

Figure 6.25 The evaluation of product sketches (designed by Western designers)

However, the result might resulted in bias because the cross evaluation which Eastern design was evaluated by western perspective and Western design was assessed by Eastern perspective as well as designers were all involved in the workshop. Therefore, a survey was conducted with general people who were not involved in the workshop to evaluate products objectively (section 6.2.7).

6.2.6. Designers' Involvement with the Card Deck

Designers from both cultural backgrounds found the cards were very helpful in their design process and their feedback is shown in Table 6.3. Eastern designers liked to use the cards to explore more potentiality, while Western designers liked to use the cards as an inspirational starting point. The card deck helped Eastern designers who were familiar with Chinese culture to dig out more possibility of integrating cultural features and design features for creating a product after a general brainstorming, for instance, they found out more information about how a design feature could be applied. However, the Western designers prefer to involve the card deck in their brainstorming to assist them to start a discussion, for instance the cards helped them in the process of selecting materials, guiding them to choose a cultural feature correlated to a target emotional response. Western designers recommended the correlation between cultural features and emotions could be further enhanced. Western designers were not very familiar with Chinese cultural, thus they need more information to help them to use the cultural features more effectively.

Table 6.3 Different ways of involving card deck by Eastern and Western designers

Eastern designers	Western designers
To explore more potentiality.	As an inspirational starting point.
Eastern designers were more familiar with Chinese culture, so after involving the card, they could quickly dig out more possibility of integrating cultural features and design features for creating a product after a brainstorming.	Westerner designers instead were not familiar with the Chinese culture, So they would like to involve the card deck to assist them to start a discussion, and to choose a proper cultural feature for the product.

Some improvement of the cards had been made based on the designers' feedback: cultural features were suggested to place at the front side of the card. The design features, which aroused certain emotional responses, were recommended to be highlighted regarding a different emotional response they aroused.

6.2.7. Appraisal of the Chinese Cultural Products

The aim of this appraisal was to evaluate products from users' perspective. In the two workshops, product concepts were evaluated by the other groups of designers who were also participated in the workshops and this might lead the appraisal to a bias. Therefore, general consumers were recruited for this survey. The participants were recruited in Uxbridge shopping centre and people who had experiences of buying souvenirs were chosen. Ten participants, five from Eastern cultural background and five from Western cultural background, were recruited. The participants were people who had never been involved in the interviews or the workshops of this research. These participants were all general people rather than design professionals. Hence, the cultural product concepts could be appraised from individuals who could give more objective viewpoints.

Four Chinese cultural products designed from the second workshop iteration were evaluated by the three criteria (section 6.2.1), which were emotional connection, cultural representative, and function. The sketches of the products were labelled by numbers. Images of the cultural feature which designers applied were provided next to the sketches. Product sketches labelled as number one and two were designed by Eastern designers; those labelled as number three and four were instead designed by Western designers. Product sketches number one and three were designed without the card deck while sketches number two and four were designed with the card deck. Each criteria of a product was be evaluated in three degrees of agreement: two dots meant highly agree, one dot meant partially agree, and no dot meant not agree (Figure 6.26). Therefore, a participant was given 24 dots in total for four product sketches to evaluate in three criteria.

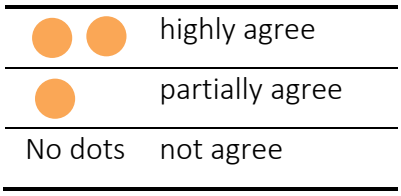


Figure 6.26 The meanings of the dots: degrees of agreement

In the criteria of emotional connection, sketches number one and two were evaluated depending if the products were attractive and number three and four were assessed depending if the products could deliver the feeling of self-expression. These two emotional descriptors were selected according to the context by designers. In the criteria of cultural representative, sketches were evaluated by if the cultural feature was well presented and synchronised with the products. In the criteria of function, usability of the product was assessed.

The result of the survey is shown in Figure 6.27. Products designed with the assistance of the card deck (product number 2&4) were evaluated much higher than ones (product number 1&3) without the toolkit particularly in the criteria of emotional connection. For instance, product sketches of Eastern designers were assessed from 9 dots (No.1) to 19 dots (No.2) and sketches of Western designers were evaluated from 7 dots (No. 3) to 16 dots (No.4). For the criteria of cultural representative, the rating of products designed with card deck and without card deck in both designer groups also increased. For example, sketches by Eastern designers were rated from 16 dots (No.1) to 17 dots (No.2) and sketches by Western designers were rated from 11 dots (No.3) to 13 dots (No.4). For the function criterion, product sketches from Eastern designers were assessed from 7 dots (No.1) to 11 dots (No.2) and sketches from Western designers were evaluated from 9 dots (No.3) to 19 dots (No.4).

In this survey, participants from both cultural backgrounds perceived more emotional connections with the products, which were designed with the assistance of the card deck much more than ones without the assistance of the card deck. That

is to say the card deck could help designers to enhance the consumers' emotional attachment to the Chinese cultural products based on the result of this survey.

Designers	Eastern designers		Western designers	
Card deck	without	with	without	with

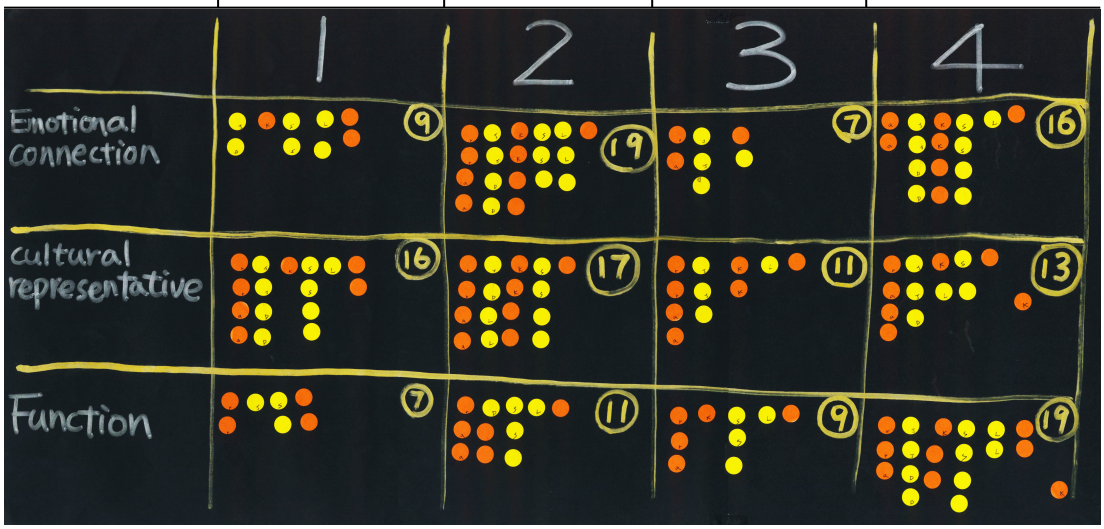


Figure 6.27 Products evaluated by potential consumers

6.2.8. Discussion

The result of the survey provided very positive feedback regarding products, which delivered stronger emotional connections with users when the products were designed by assistance of the card deck. In the workshop iteration two, it was obvious from the result that the card deck assisted both Eastern and Western designers in creating Chinese cultural products which can enhance users' emotional attachment.

In the workshop iteration two, the role of the card was to be involved in the idea generating process rather than leading the process. Therefore, designers felt they were not restricted to the card deck. The improved card deck provided clearer information including the highlight of design features correlated to an emotional response, images of example products, and definitions of emotional experiences.

However, it was found that the connection between the emotional responses and design features still need to be more precisely focused. It was suggested by the designers that it would be easier to use the card for Chinese cultural product if the cultural features were presented on the front of the cards. Therefore, The improvement of the card deck will be presented in the final design.

6.3 Final design

This section presents the final version of the card deck, which was modified regarding the feedback from workshop iteration two. A cultural feature was presented at the front of the card along with the same colour in order to be consistent (Fig 6.28). Design features which potentially affected the emotional responses were enlarged and highlighted. Taking cultural feature of utensil and object for example, applying design features of *colour* and *pattern* would potentially result in arousing a feeling of luxurious, so design features of *colour* and *pattern* were enlarged to show their connection with correlated emotional responses. Applications of utilizing design features of a *structure*, *shape,* or *material* from the 'utensils & objects' category would potentially lead to arouse a feeling of self-expression.

Figure 6.28 An example of the finalised card deck

Summary

This set of design card deck is created to be used in an initial design process where the brainstorming or idea generation are taking place. The purpose of the card deck is to inspire designers with more information to design Chinese cultural products. The card deck is double-sided which one side for cultural features and the other side for the correlated emotional responses and design features. Designers can pick up the cultural features that they possibly use and look into the correlated information at the back for the possible emotional responses and example products. The card deck is designed to help designers pick up the information they need and to generate more ideas and expand the possibilities of applications. The card deck is not to limit designers' creation; instead designers can see it as basic information to expand their thoughts in idea generation and to explore possible applications.

The experts and design professionals were mainly recruited from undergraduate and postgraduate of Brunel University and few was from industries. The ages of the experts and designers fell between 20-35 years old. This may impact on the results showing the preference of younger designers.

This chapter described the development and evaluation of the card deck. Following the clarification of the research questions revealed in Chapter 2 and 4, and deliberation of appropriate research methodology on Chapter 3, this chapter described the development of the toolkit that comprised experts' interview, workshops, and a survey.

The research question that needed to be answered in this chapter was:

What information a cultural product toolkit should have for designers?

Initially, the iterations of the card deck prototype were built up by the author (card deck prototype). Then, the card deck was improved through experts' group interviews (iteration 1 to 4). The developed card deck regarding feedback from

experts was tested in workshop iterations (iteration 5 to 6). In addition, the result of an appraisal of the products designed in the second workshop suggested that the emotional engagement increased when the products were designed by using the card deck. As a result, the card deck was finalised based on the development through experts' interview and validation via the workshops.

- **A development of the card deck prototype**

The development of the card deck prototype was based on cultural features, design features, and emotional descriptors. Cultural features were the inspirational source which can be transferred or applied to design new products. In the first iteration, only cultural features and examples of products were highlighted. Even though design features and emotional responses were presented, the information was not clear. In the second iteration, design features were presented literally. Examples of products in the section of emotional responses were repetitive and not easy to be focused. In the third iteration, the design features were presented visually. In the fourth iteration, the cards were designed into two sides. Cultural features, design features, and emotional descriptors were all emphasised and visually presented. Additional information such as age range of potential users, designers of the example products and inspiring questions were included.

- **Insights from experts' interviews, workshops, and a customer survey**

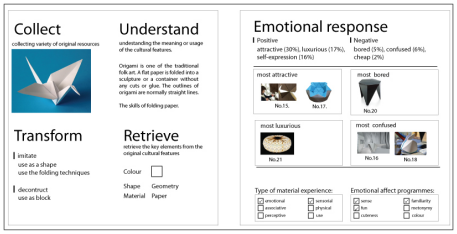
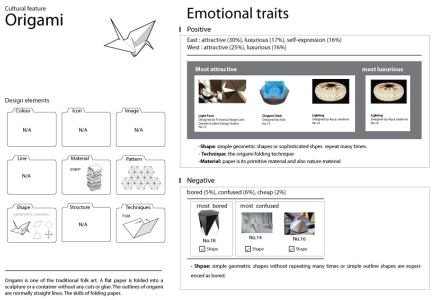
The card deck for Chinese cultural product design was highly valued and it efficiently helped to generate ideas in the brainstorming process. The graphic design of the card deck was highly valued and the contents of the card deck were improved in every stage of workshop iterations. After the first iteration workshop, inspiring questions on the front were removed because designers found the questions were not very helpful; definitions of the emotional descriptors were added onto the card to provide a better understanding. In addition, some design features were

highlighted and enlarged regarding to an emotional response which was specifically aroused by the combination of the design features and its cultural feature. Images of the examples were also included. After the second workshop iteration, more information such as detail descriptions of design features was provided, because it can particularly better help Western designers for further research. Cultural features were presented in the front side rather than emotional descriptors because this provided a more intuitive usage of the card deck. Arranging an emotional response and correlated design features at the back of the card could enhance the understanding of the correlation between them.

The directions taken in the development were chiefly driven by insights from experts' interview, workshops utilising the toolkit, feedback from practitioners and evaluation of potential consumers. Thus, the development mainly stemmed from empirical insights. Design experts and design practitioners participated during process of developing the card deck, in order to ensure the information provided on the cards can fit designers' needs. Therefore, interviews with design experts were conducted to develop the card deck, and workshops involving design practitioners were carried out to validate the card deck. The result of the appraisal of product design concepts supported that consumers engaged more in Chinese cultural products which were designed with the card deck.

- **The iteration progress**

The iteration process included four expert interviews and two workshops. The aim of expert interview is to develop the toolkit and the target of the workshops is to validate the card deck for a practical design use. The developing process of the card deck is shown in Table 6.29.

<table>
<tr><th colspan="3">Development of the card deck</th></tr>
<tr><th>Iteration</th><th>1</th><th>2</th></tr>
<tr><td>An example of the card</td><td> 
</td><td> 
</td></tr>
<tr><td>Feedback</td><td>- add the design process of retrieve cultural features
- product material could also contribute to emotions</td><td>- present the design features graphically
- material experience might not be needed in the card</td></tr>
<tr><th>Iteration</th><th>3</th><th>4</th></tr>
<tr><td>An example of the card</td><td> 
</td><td> 
</td></tr>
<tr><td>Feedback</td><td>- inspiring questions could be considered in the cards
- highlight the design features which is currently applied
- layout: double sided cards</td><td>- add definitions of the emotional experiences
- add images of examples</td></tr>
</table>

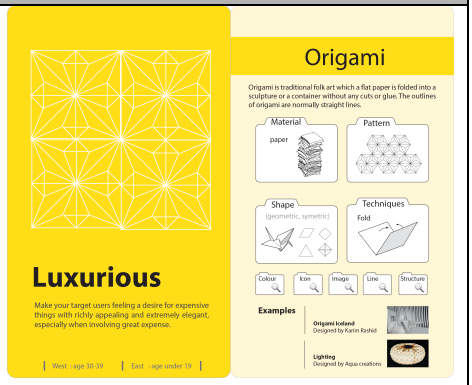
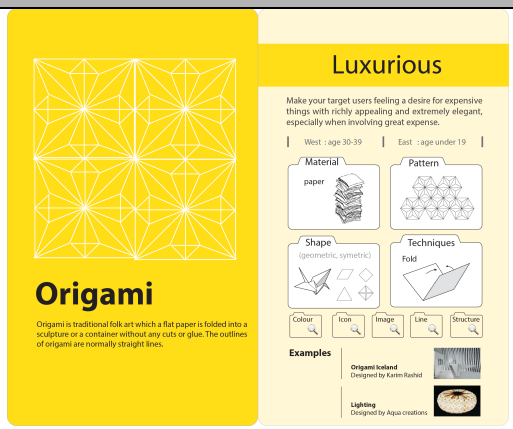
<table>
<tr><th colspan="3">Validation of the card deck</th></tr>
<tr><th>Iteration</th><td>5</td><td>6</td></tr>
<tr><th>An example of the card</th><td> 
</td><td> 
</td></tr>
<tr><th>Feedback</th><td>- enlarge the applied ones and minimise the empty spaces of design features</td><td>- put cultural features at the front and emotional experiences at the back</td></tr>
<tr><th colspan="3">Final</th></tr>
<tr><th>An example of the card</th><td colspan="2"> 
</td></tr>
</table>

Figure 6.29 The developing process of the card deck

The card deck contains 15 double-sided cards and involves 8 cultural categories with correlated possible emotional experiences. The card deck can be introduced to designers when they are in the process of idea generation or brainstorming. The card deck can provide information needed for inspiring designers by showing the current Chinese cultural products, the possible correlation between cultural features, design features, and emotional experience. For example, when a designer wants to explore Chinese cultural products which inspired from traditional vases, he could look it up from the cards in purple from the category of 'utensil & object'. There are three

cards in purple and each of them indicate possible elicited emotional experience -- such as ‘luxurious’, ‘self-expression’, and ‘nostalgia’ – along with examples and the design features applied. The ‘self-expression’ experience is more likely to be elicited in the category of ‘utensil & object’ when the structure and the shape of the objects are applied on the products. When the colour and the patterns of an object are applied on the products, it is more possible to elicit ‘nostalgia’ or ‘luxurious’. That is to say, in the same category of cultural feature, we can see that different design features could also contribute to various emotional experiences. The cards may give a clue of possible emotional experiences elicited by some certain correlation between cultural features and design features. In addition, the examples which card deck provided are current applications, and thus designers can create their products based on the information derived from the current products and can explore more possibility of unapplied ones.

7

CONCLUSION

The importance of this research is in the examination of emotional connections between Chinese cultural products and consumers. Consumers' emotional engagement to Chinese cultural products was first investigated in this study. The findings showed that different types of cultural features could arouse specific emotional responses. The outcome of the research was to create a design toolkit that can be used by designers to enhance consumers' engagement of Chinese cultural products.

This section summarises the main results of the research performed in this thesis, together with a discussion of how the research questions have been answered, limitations of the research, and contributions to knowledge in the design field. The main achievements of this research were:

1) this research was the first to create categories of Chinese cultural features for use in product design

2) a design toolkit of Chinese cultural products, which was designed to enhance emotional engagements between products and consumers, was created to assist designers.

7.1. Answering the Research Questions

The research questions had been answered through literature review and investigated by empirical studies. Therefore, the answers to the questions were addressed below.

Q1. What are the Chinese cultural features that characterise a cultural product?

Culture has many facets and can be defined from various angles, however, in this thesis the focus is on visual cultural features that can be commonly recognised and have the potential to be applied in industrial products. Cultural features are the main characteristics of a cultural product, but categories of cultural features, which are applicable for design use, had not been suggested in previous research. Therefore, categories of applicable cultural features for design use are suggested by this research; the categories include handwriting and painting, printing, origami, utensils and objects, customs, food, architecture, religion, and nature (chapter 2; section 2.3). These cultural features are representative and important because they are commonly recognised by the original culture. These features have been highlighted in categories of museum collections and applied in the current market.

Q2. How do Eastern and Western populations emotionally appraise Chinese cultural products?

It was found that the pleasantness perceived by both the Eastern and Western populations were not significantly different in all categories of cultural features, except products inspired from food or religion. Therefore, research results suggest that designers should consider consumers' cultural background when they apply cultural features of food or religion in products. In addition, cultural features were perceived differently across age groups of consumers; the analysis was demonstrated in Chapter 5. This information was provided in the card deck in order to help designers who are looking to target a specific age group.

Q3. What emotions could be expressed in reaction to certain cultural features?

What specific emotions could be potentially aroused by a certain cultural feature?

This research question was answered through a literature review to select potential emotional responses. A survey with 140 participants including half from Eastern and half from Western cultural backgrounds was conducted to investigate their emotional responses to cultural features. The potential emotional descriptors were selected from psychology studies and emotional assessments as well as current emotional branding in the market (chapter 3; section 5.2). Terms that were used frequently and deemed to be relevant to cultural products were selected as the emotional descriptors for this research. Thus, the selected positive emotional responses were attractive, humorous, amused, self-expression, luxurious and nostalgia. These emotional responses were selected mainly from emotional branding where the emotion a product conveys is a focus of the design. Additionally, Self-assessment Manikin (SAM) was adopted in the questionnaire to investigate how people perceived cultural products in two dimensions: pleasantness and arousal. Therefore, the answer to this research question was demonstrated below (Table 7.1) and it provided a foundation for the development of the toolkit.

Table 7.1 Correlated emotional responses to cultural features

Cultural features	***Correlated emotional responses***
Handwriting & painting	*Nostalgia*
Printing & paper cutting	*Nostalgia, Self-expression*
Origami	*Attractive, Luxurious*
Utensils & objects	*Luxurious, Nostalgia, Self-expression*
Customs	*Humorous*
Food	*Amused, Humorous*
Architecture	*Humorous, Luxurious, Nostalgia*
Religion	*Humorous*

Q4. What information should a cultural product toolkit have for designers?

The research aimed to design a toolkit of Chinese cultural products which can serve as an inspirational tool either for Eastern or Western designers in order to improve emotional attachment to cultural products. A cultural product is mainly recognised by its cultural features. Additionally, the way the cultural feature is applied to the product is an important factor because it affects how people perceive it. In the analysis of the questionnaire, it was found that each cultural feature can arouse its own specific emotional responses. Cultural features, design features, and the correlated emotional responses were provided in the card deck. Additional information, such as potential consumer age range and examples of Chinese cultural products, were also included in the card deck. The information was validated by an experts' interview and iterative workshops with designers. Designers gave positive feedback on using the card deck to design Chinese cultural products. Involving the cards in the design process helped designers to explore additional possibilities of applying cultural features and assisted designers to enhance the generating of ideas in the brainstorming. In respect to a survey regarding the Chinese cultural products designed during the workshops, emotional connections were enhanced in the products that were designed with the assistance of the cards rather than those products that were designed without the card deck.

7.2. Validity and Reliability of the Research

This research was conducted by means of literature review, surveys, expert's interviews, and iterative workshops (Figure 7.1). The validity of this research will be checked by the possible bias that might be caused as well as by the accurate reflection of research findings. The research process will be examined in order to keep the reliability of the research.

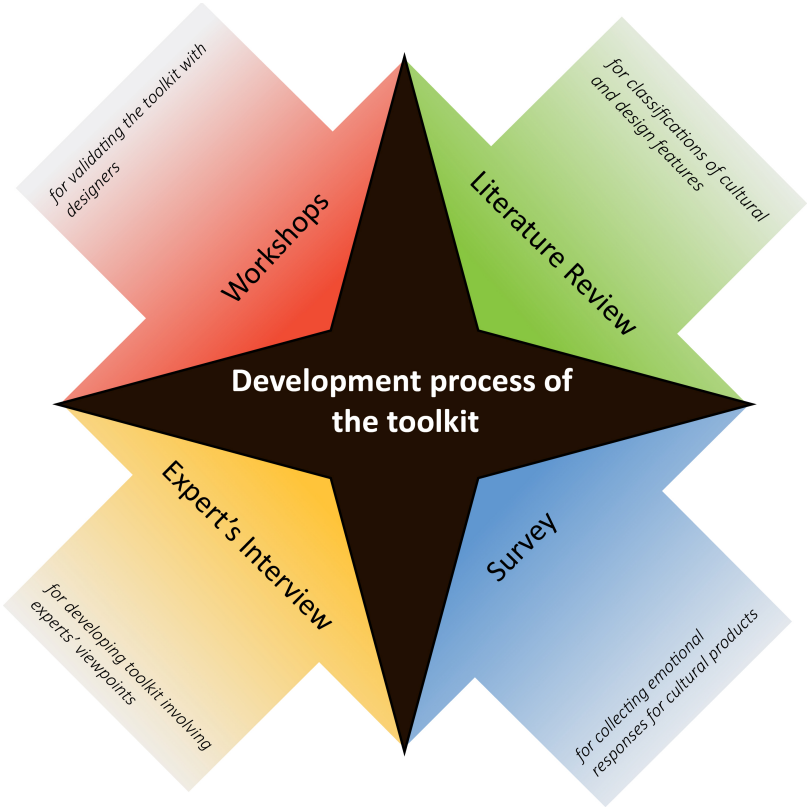


Figure 7.1 Approaches of developing the toolkit

Literature review

The literature review in this research contained two parts: constitutions of cultural products and human emotions. In chapter two, constitutions of cultural products, such as cultural features and design features, as well as definitions of cultural products were described. A literature review was conducted to select and categorise both visible cultural features and applicable design features, which can be used in industrial product design. Design methods which were used to incorporate cultural features in industrial design, graphic design, and product design were introduced. In addition, design processes and models for cultural products were also discussed. Hence, an overview of how cultural products were created during the design processes and what constituted cultural products were presented.

Emotions dominate people's decision-making when choosing products, thus, how Chinese cultural products are perceived was a focus of this research. A review of human emotions and how information is processed in product appraisal was introduced in chapter five.

The categories of cultural features are possibly applied to most of the cultures. The subcategories of cultural features are examples of Chinese culture. The categories might not cover all the cultural features for every culture, but the categories summarised by this research could be seen as a growing system that designers can apply them as a starting point and can add their own categories depending on their cultural sensitivity.

Survey

A survey was conducted to investigate human emotions on Chinese cultural products. The result of this survey showed that both populations from Eastern and Western cultural backgrounds had positive feedback of Chinese cultural products. Additionally, specific emotions could be aroused by a certain cultural feature. This emotional link between the cultural products and consumers was revealed and the result contributed to the creation of design toolkit.

The collection of the product images for the survey might be biased due to the researcher's experience and perspective. When selecting product images from a number of relevant images, the researcher selected products that apply different design features for the same cultural feature. The researcher tried to pick up products, which she regarded as creative applications rather than the repetitive ones. However, when the researcher selected one example among all similar products for a cultural feature, the bias might be appeared due to the researcher's past experience or preference. The results of the survey showed that most cultural products elicit 'humorous' or 'nostalgia' feelings. This might reflect the chosen products, which the researcher thought to be creative, tend to be humorous. Products that were chosen as a normal and general applications tend to be nostalgia, especially these products were souvenirs of museums or gift shops.

Experts' interview

After a prototype card deck was created, expert's interviews were conducted to give feedback to the development of the card deck. In total, four iterations of interviews were conducted to during the development. The card deck was then validated by the workshops in order to test whether the toolkit was created and used as intended.

In the expert interviews, peers assisted the researcher to uncover taken for grated bias when developing the card deck. The feedback of the experts in each iteration was accurately presented in section 6.1. The experts involved in the whole process of development of the card deck. It was developed from initial prototype, exploring potential needed information for cultural product designers, optimizing the contents and layout of the card deck, and then finalising the card deck.

Workshops

The toolkit was accomplished by the iterative workshops where designers provided their insights and shared empirical design experience to validate the card deck. Then, a survey was conducted with participants, who were not involved in the workshops, to appraise the product ideations created with and without the assistance of the card deck.

The workshops were conducted in order to validate whether the card deck would work as expected and what to improve in order to assist designers in their idea generation. The process of the workshop and the feedback from the designers were clearly presented in section 6.2. Finally, a survey was conducted with general customers, who didn't participate in the workshops and so can judge objectively, to appraise the Chinese cultural product sketches created from the workshops. The result was positive that the Chinese cultural products which were created by the assistance of the card deck could improve the emotional connections with the customers. Although there were just 10 general participants for the product appraisal, it showed the positive affect of the card deck on the products.

7.3. Limitations

In considering how the thesis answered the research questions, several limitations of the overall process emerged. Despite achieving positive results from the validation from the workshops, some constraints should also be considered in this study. Searching for all cultural products produced in the world is unlikely to achieve, however, Internet technology makes it more accessible as well as these products or displayed or tagged online are focused to some extent. The images of Chinese cultural products were collected mainly from Google image search, museum websites, and design award competition archives. Thus, the sample images of Chinese cultural products was limited to those that had been photographed, selected as content on website, and labelled with keywords that described these items as cultural products. This is significant because these cultural products have been previously highlighted as existing cultural products, rather than conceptual products.

Furthermore, participant recruitment for this study included participants from both Eastern and Western cultural backgrounds. The questionnaires were spread both by electronic files and hard copies in order to cover participants who can and cannot access to computers. The data was collected through convenient sampling technique which might cause biases or cannot be generalised. However, as a pilot study of investigating emotional responses of Chinese cultural products, the result can serve as a pointer to suggest the development of the design toolkit.

Additionally, a limitation of this research was the limited number of directly related studies that had been published in previous research on industrial cultural products. Without much directly related research, it was difficult to find support or comparisons with the topic. However, this can also be viewed as an opportunity to investigate a gap in current research.

7.4. Recommendations for Future Work

The research has achieved its aim and objectives. The main purpose of this research not only suggests categories of cultural features, design features and emotional descriptors, but also explores potential emotional connections between consumers and cultural products. Eventually, the emotional engagement with cultural products could bring great profit into the global business. The most applications of cultural products would be in gift shops of museums and tourist places. These products sold in the gift shops are mainly copies of original source, but in different or similar materials. For instance, images or photos of a touristic place are normally printed on mugs, or classic collections of museums are copied and printed on the surface of a folder. However, this type of coping original source on an industrial product is very common and consumers have less attraction to these products. Therefore, the toolkit was also highly recommended to introduce to museums and tourist gift shops who may be highly interested in improving consumer satisfaction of their cultural products in order to increase more profits. Additionally, regarding to the toolkit it was recommended to develop a digital version of toolkit such as an app or a website to have multiple accesses and to expand the contents accordingly.

Emotions dominate our decisions, enhance our memories and lead us to get attention in the environment. Also, emotions could be aroused by the meaning that a product delivers or the memory aroused by the product. Thus, the research conducted in this thesis initiated to involve emotions in Chinese cultural products in order to make a stronger emotional engagement with consumers. The research mainly focuses on Chinese cultural features, thus future studies are recommended to investigate other local or national cultural features and to measure correlated emotional responses.

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13 February 2015

STATEMENT OF ETHICS APPROVAL

Proposer: Yu-Han Wang Student ID No: 1110273/1

Dear Yu-Han,

Project Title: Cultural features for new product design development

Under delegated authority from the College Research Ethics Committee, I have considered the proposal recently submitted by you. I am satisfied that there is no objection on ethical grounds to the proposed study.

Approval is given on the understanding that you will not be working alone in the workshop and will adhere to the terms agreed with participants. You are obliged to inform me of any change of plans in relation to the information provided in the application form.

Yours sincerely,

John Park
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Appendix

Appendix A : Emotions suggested by Parrott (2001)

Primary emotions	Secondary emotions	Tertiary emotions
fear	Horror	Alarm, shock, fear, fright, horror, terror, panic, hysteria, mortification
	Nervousness	Anxiety, nervousness, tenseness, uneasiness, apprehension, worry, distress, dread
anger	Disgust	Disgust, revulsion, contempt
	Envy	Envy, jealousy
	Exasperation	Exasperation, frustration
	Irritation	Aggravation, irritation, agitation, annoyance, grouchiness, grumpiness
	Rage	Anger, rage, outrage, fury, wrath, hostility, ferocity, bitterness, hate, loathing, scorn, spite, vengefulness, dislike, resentment
	Torment	Torment
Joy	Cheerfulness	Amusement, bliss, cheerfulness, gaiety, glee, jolliness, joviality, joy, delight, enjoyment, gladness, happiness, jubilation, elation, satisfaction, ecstasy, euphoria
	Contentment	Contentment, pleasure
	Enthrallment	Enthrallment, rapture
	Optimism	Eagerness, hope, optimism
	Pride	Pride, triumph
	Relief	Relief
	Zest	Enthusiasm, zeal, zest, excitement, thrill, exhilaration
love	Affection	Adoration, affection, love, fondness, liking, attraction, caring, tenderness, compassion, sentimentality
	Lust	Arousal, desire, lust, passion, infatuation
	Longing	Longing
sadness	Disappointment	Dismay, disappointment, displeasure
	Neglect	Alienation, isolation, neglect, loneliness, rejection, homesickness, defeat, dejection, insecurity, embarrassment, humiliation, insult
	Sadness	Depression, despair, hopelessness, gloom, glumness, sadness, unhappiness, grief, sorrow, woe, misery, melancholy
	Shame	Guilt, shame, regret, remorse
	Suffering	Agony, suffering, hurt, anguish
	Sympathy	Pity, sympathy
surprise	Surprise	Amazement, surprise, astonishment

Appendix B: the results of the SAM

B1 Mann-Whitney U Test

Test Statistics[a]

	P1	P2	P3	P4	P5	P6
Mann-Whitney U	2385.500	2164.500	2402.500	2410.500	1844.500	2274.000
Wilcoxon W	4870.500	4649.500	4887.500	4895.500	4329.500	4759.000
Z	-.287	-1.254	-.207	-.174	-2.597	-.768
Asymp. Sig. (2-tailed)	.774	.210	.836	.862	.009	.443

Test Statistics[a]

	P7	P8	P9	P10	P11	P12
Mann-Whitney U	2437.500	2298.500	2293.000	2356.500	2427.500	1937.500
Wilcoxon W	4922.500	4783.500	4778.000	4841.500	4912.500	4422.500
Z	-.054	-.674	-.686	-.398	-.100	-2.235
Asymp. Sig. (2-tailed)	.957	.500	.493	.690	.920	.025

Test Statistics[a]

	P13	P14	P15	P16	P17	P18
Mann-Whitney U	2427.500	2420.500	2210.500	1911.500	2036.500	2075.500
Wilcoxon W	4912.500	4905.500	4695.500	4396.500	4521.500	4560.500
Z	-.099	-.127	-1.049	-2.326	-1.847	-1.642
Asymp. Sig. (2-tailed)	.921	.899	.294	.020	.065	.101

Test Statistics[a]

	P19	P20	P21	P22	P23	P24
Mann-Whitney U	2251.500	2343.000	2252.500	1953.500	1885.000	2271.500
Wilcoxon W	4736.500	4828.000	4737.500	4438.500	4370.000	4756.500
Z	-.879	-.463	-.851	-2.140	-2.415	-.777
Asymp. Sig. (2-tailed)	.380	.643	.395	.032	.016	.437

Test Statistics[a]

	P25	P26	P27	P28	P29	P30
Mann-Whitney U	2234.000	2008.500	1915.500	2171.500	2298.500	2165.500
Wilcoxon W	4719.000	4493.500	4400.500	4656.500	4783.500	4650.500
Z	-.943	-1.910	-2.339	-1.193	-.669	-1.245
Asymp. Sig. (2-tailed)	.346	.056	.019	.233	.503	.213

Test Statistics[a]

	P31	P32	P33	P34	P35	P36
Mann-Whitney U	2322.500	1900.000	1814.500	2258.000	2274.500	2035.500
Wilcoxon W	4807.500	4385.000	4299.500	4743.000	4759.500	4520.500
Z	-.554	-2.349	-2.786	-.845	-.763	-1.790
Asymp. Sig. (2-tailed)	.580	.019	.005	.398	.445	.073

Test Statistics[a]

	P37	P38	P39	P40
Mann-Whitney U	1846.000	2351.000	2349.500	1966.000
Wilcoxon W	4331.000	4836.000	4834.500	4451.000
Z	-2.611	-.429	-.441	-2.092
Asymp. Sig. (2-tailed)	.009	.668	.659	.036

a. Grouping Variable: EW

Ranks

	EW	N	Mean Rank	Sum of Ranks
P1	Eastern	70	69.58	4870.50
	Western	70	71.42	4999.50
	Total	140		
P2	Eastern	70	66.42	4649.50
	Western	70	74.58	5220.50
	Total	140		
P3	Eastern	70	69.82	4887.50
	Western	70	71.18	4982.50
	Total	140		
P4	Eastern	70	71.06	4974.50
	Western	70	69.94	4895.50
	Total	140		
P5	Eastern	70	61.85	4329.50
	Western	70	79.15	5540.50
	Total	140		
P6	Eastern	70	67.99	4759.00
	Western	70	73.01	5111.00
	Total	140		
P7	Eastern	70	70.32	4922.50
	Western	70	70.68	4947.50
	Total	140		
P8	Eastern	70	72.66	5086.50
	Western	70	68.34	4783.50
	Total	140		
P9	Eastern	70	68.26	4778.00
	Western	70	72.74	5092.00
	Total	140		
P10	Eastern	70	71.84	5028.50
	Western	70	69.16	4841.50
	Total	140		

P11	Eastern	70	70.82	4957.50
	Western	70	70.18	4912.50

Ranks

	EW	N	Mean Rank	Sum of Ranks
P11	Total	140		
	Eastern	70	77.82	5447.50
P12	Western	70	63.18	4422.50
	Total	140		
	Eastern	70	70.18	4912.50
P13	Western	70	70.82	4957.50
	Total	140		
	Eastern	70	70.92	4964.50
P14	Western	70	70.08	4905.50
	Total	140		
	Eastern	70	73.92	5174.50
P15	Western	70	67.08	4695.50
	Total	140		
	Eastern	70	78.19	5473.50
P16	Western	70	62.81	4396.50
	Total	140		
	Eastern	70	76.41	5348.50
P17	Western	70	64.59	4521.50
	Total	140		
	Eastern	70	75.85	5309.50
P18	Western	70	65.15	4560.50
	Total	140		
	Eastern	70	73.34	5133.50
P19	Western	70	67.66	4736.50
	Total	140		
	Eastern	70	68.97	4828.00
P20	Western	70	72.03	5042.00
	Total	140		
	Eastern	70	73.32	5132.50
P21	Western	70	67.68	4737.50
	Total	140		
P22	Eastern	70	77.59	5431.50

Ranks

	EW	N	Mean Rank	Sum of Ranks
P22	Western	70	63.41	4438.50
	Total	140		
P23	Eastern	70	78.57	5500.00

	Western	70	62.43	4370.00
	Total	140		
	Eastern	70	73.05	5113.50
P24	Western	70	67.95	4756.50
	Total	140		
	Eastern	70	67.41	4719.00
P25	Western	70	73.59	5151.00
	Total	140		
	Eastern	70	76.81	5376.50
P26	Western	70	64.19	4493.50
	Total	140		
	Eastern	70	78.14	5469.50
P27	Western	70	62.86	4400.50
	Total	140		
	Eastern	70	74.48	5213.50
P28	Western	70	66.52	4656.50
	Total	140		
	Eastern	70	72.66	5086.50
P29	Western	70	68.34	4783.50
	Total	140		
	Eastern	70	74.56	5219.50
P30	Western	70	66.44	4650.50
	Total	140		
	Eastern	70	68.68	4807.50
P31	Western	70	72.32	5062.50
	Total	140		
	Eastern	70	78.36	5485.00
P32	Western	70	62.64	4385.00
	Total	140		

Ranks

	EW	N	Mean Rank	Sum of Ranks
	Eastern	70	79.58	5570.50
P33	Western	70	61.42	4299.50
	Total	140		
	Eastern	70	73.24	5127.00
P34	Western	70	67.76	4743.00
	Total	140		
	Eastern	70	67.99	4759.50
P35	Western	70	73.01	5110.50
	Total	140		
P36	Eastern	70	76.42	5349.50

	Western	70	64.58	4520.50
	Total	140		
	Eastern	70	79.13	5539.00
P37	Western	70	61.87	4331.00
	Total	140		
	Eastern	70	71.91	5034.00
P38	Western	70	69.09	4836.00
	Total	140		
	Eastern	70	71.94	5035.50
P39	Western	70	69.06	4834.50
	Total	140		
	Eastern	70	63.59	4451.00
P40	Western	70	77.41	5419.00
	Total	140		

B2 Reliability Statistic of each category of cultural features

1) Handwriting & painting

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.532	.540	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
P1	15.39	8.571	.336	.163	.465
P2	15.54	8.566	.301	.101	.478
P3	15.59	7.928	.384	.204	.435
P4	15.24	9.102	.166	.078	.537
P5	16.16	7.356	.290	.129	.488
P6	15.59	8.676	.229	.144	.510

2) Printing & paper cutting

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.579	.587	6

Inter-Item Correlation Matrix

	P7	P8	P9	P10	P11	P12
P7	1.000	.339	.066	.107	.190	.239
P8	.339	1.000	.281	.118	.085	.304
P9	.066	.281	1.000	.135	.129	.079
P10	.107	.118	.135	1.000	.204	.325
P11	.190	.085	.129	.204	1.000	.274
P12	.239	.304	.079	.325	.274	1.000

3) origami

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.751	.750	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
P13	21.37	16.523	.446	.252	.726
P14	21.66	15.493	.506	.297	.712
P15	21.32	16.277	.537	.339	.707
P16	21.64	15.888	.482	.284	.718
P17	21.46	16.538	.468	.234	.721
P18	22.10	16.119	.528	.320	.708
P19	21.31	18.114	.303	.139	.753

4) Utensils & objects

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.533	.521	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
P20	19.65	13.150	.290	.136	.484
P21	19.79	13.331	.209	.103	.518
P22	19.98	12.079	.352	.327	.455
P23	19.79	11.273	.445	.297	.408
P24	19.91	13.748	.212	.150	.514
P25	19.30	14.873	.101	.120	.550
P26	19.44	13.385	.228	.067	.508

5) customs

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.557	.559	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
P27	13.10	7.558	.315	.119	.504
P28	14.21	7.479	.301	.102	.513
P29	13.00	7.741	.346	.137	.485
P30	13.61	8.197	.296	.112	.514
P31	13.76	7.793	.336	.131	.492

6) food

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.533	.546	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
P32	3.56	1.053	.375	.141	.
P33	3.33	1.762	.375	.141	.

7) Architecture

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.570	.570	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
P34	3.44	1.111	.399	.159	.
P35	3.58	1.008	.399	.159	.

8) religion

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.585	.586	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
P36	3.11	1.311	.415	.172	.
P37	2.43	1.513	.415	.172	.

9) nature

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.423	.428	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
P38	7.01	2.799	.218	.066	.396
P39	6.91	2.632	.340	.116	.173
P40	6.87	2.818	.213	.062	.406

B3 Normality of each category of cultural feature

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
M1	.092	140	.006	.981	140	.045
M2	.124	140	.000	.979	140	.032
M3	.083	140	.019	.983	140	.073
M4	.092	140	.006	.981	140	.052
M5	.102	140	.001	.983	140	.088
M6	.114	140	.000	.957	140	.000
M7	.159	140	.000	.950	140	.000
M8	.126	140	.000	.961	140	.000
M9	.112	140	.000	.972	140	.005

a. Lilliefors Significance Correction

B-4 Mann-Whitney test of every category of cultural features

Test Statistics[a]

	M1	M2	M3	**M4**	M5	**M6**
Mann-Whitney U	2003.000	2267.000	2048.000	**1898.500**	2108.500	**1695.500**
Wilcoxon W	4488.000	4752.000	4533.000	**4383.500**	4593.500	**4180.500**
Z	-1.873	-.766	-1.680	**-2.306**	-1.431	**-3.182**
Asymp. Sig. (2-tailed)	.061	.444	.093	**.021**	.153	**.001**

Test Statistics[a]

	M7	**M8**	M9
Mann-Whitney U	2429.500	**1817.000**	2339.500
Wilcoxon W	4914.500	**4302.000**	4824.500
Z	-.087	**-2.670**	-.466
Asymp. Sig. (2-tailed)	.931	**.008**	.641

a. Grouping Variable: EW

B5. Results from emotional descriptors

B5-1 Selected times and percentage of emotional descriptors from Eastern participants

From Eastern Participants

Descriptors / Sample	positive descriptors						Negative descriptors					
	attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
Sum	1097	477	463	698	512	381	362	34	326	62	192	36
percentage	24	10	10	15	11	8	8	1	7	1	4	1

B5-2 Original data of Selected times by each category of cultural features.

Responses from Eastern participants

Descriptors (original) / Cultural features	attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
handwriting and painting	109	17	13	70	52	82	91	4	68	15	41	11
printing and paper cutting	163	67	54	121	78	104	61	2	36	8	30	4
origami	240	82	84	131	133	15	39	3	44	7	14	2
utensils and objects	229	61	83	149	128	89	59	4	91	8	39	3
customs	126	92	85	83	39	31	39	6	35	11	19	8
food	54	50	58	27	13	6	14	0	5	0	14	0
architecture	64	14	10	52	29	28	8	2	14	4	4	3
religion	32	45	38	15	2	9	29	13	18	8	11	4
nature	80	49	38	50	38	17	22	0	15	1	20	1

B5-3 The average Selected times by each category of cultural features

Responses from Eastern participants
(ratio of each cultural feature)

Descriptors (%) / Cultural features	attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic	sum
handwriting and painting	19	3	2	12	9	14	16	1	12	3	7	2	100
printing and paper cutting	22	9	7	17	11	14	8	0	5	1	4	1	100
origami	30	10	11	16	17	2	5	0	6	1	2	0	100
utensils and objects	24	6	9	16	14	9	6	0	10	1	4	0	100
customs	22	16	15	14	7	5	7	1	6	2	3	1	100
food	22	21	24	11	5	2	6	0	2	0	6	0	100
architecture	28	6	4	22	13	12	3	1	6	2	2	1	100
religion	14	20	17	7	1	4	13	6	8	4	5	2	100
nature	24	15	11	15	11	5	7	0	5	0	6	0	100

B5-4 The average of Selected times for each emotion descriptor.

Responses from Eastern participants
(ticked times devided by numbers of products in each category)

Descriptors / Cultural features	attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
handwriting and painting	18.2	2.8	2.2	11.7	8.7	13.7	15.2	0.7	11.3	2.5	6.8	1.8
printing and paper cutting	27.2	11.2	9.0	20.2	13.0	17.3	10.2	0.3	6.0	1.3	5.0	0.7
origami	34.3	11.7	12.0	18.7	19.0	2.1	5.6	0.4	6.3	1.0	2.0	0.3
utensils and objects	32.7	8.7	11.9	21.3	18.3	12.7	8.4	0.6	13.0	1.1	5.6	0.4
customs	25.2	18.4	17.0	16.6	7.8	6.2	7.8	1.2	7.0	2.2	3.8	1.6
food	27.0	25.0	29.0	13.5	6.5	3.0	7.0	0.0	2.5	0.0	7.0	0.0
architecture	16.0	22.5	19.0	7.5	1.0	4.5	4.0	1.0	7.0	2.0	2.0	1.5
religion	16.0	22.5	19.0	7.5	1.0	4.5	14.5	6.5	9.0	4.0	5.5	2.0
nature	26.7	16.3	12.7	16.7	12.7	5.7	7.3	0.0	5.0	0.3	6.7	0.3

B5-5 The percentage of the Selected times for each emotion descriptor

Responses from Eastern participants
(percentage of every emotion descriptor)

Descriptors / Cultural features	attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
handwriting and painting	8.1	2.0	1.6	8.7	9.9	19.6	19.0	6.2	16.9	17.2	15.4	21.3
printing and paper cutting	12.2	8.0	6.8	15.1	14.8	24.9	12.7	3.1	8.9	9.2	11.3	7.8
origami	15.4	8.4	9.1	14.0	21.6	3.1	7.0	4.0	9.4	6.9	4.5	3.3
utensils and objects	14.7	6.3	9.0	15.9	20.8	18.2	10.5	5.3	19.4	7.9	12.5	5.0
customs	11.3	13.2	12.9	12.4	8.9	8.9	9.8	11.2	10.4	15.2	8.6	18.6
food	12.1	18.0	22.0	10.1	7.4	4.3	8.8	0.0	3.7	0.0	15.8	0.0
architecture	7.2	16.2	14.4	5.6	1.1	6.5	5.0	9.3	10.4	13.8	4.5	17.4
religion	7.2	16.2	14.4	5.6	1.1	6.5	18.1	60.7	13.4	27.6	12.4	23.3
nature	11.9	11.7	9.6	12.5	14.4	8.1	9.2	0.0	7.5	2.3	15.0	3.9

B5-6 Selected times and percentage of emotional descriptors from Western participants

Descriptors / Selected times	positive descriptors						Negative descriptors					
	attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
Sum	836	300	496	299	453	149	346	60	366	122	249	125
percentage	22	8	13	8	12	4	9	2	10	3	7	3

B5-7 Original data of Selected times by each category of cultural features

Responses from Western participants
(Original data - ticked times)

Descriptors / Cultural features	attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
handwriting and painting	116	8	53	31	53	28	62	4	63	15	41	19
printing and paper cutting	136	28	72	55	60	16	42	3	45	19	50	16
origami	163	47	88	61	105	12	53	12	55	22	28	17
utensils and objects	135	36	67	46	91	39	59	16	80	28	29	21
customs	104	64	78	32	32	16	28	14	46	22	34	24
food	36	35	41	11	15	4	14	1	17	2	10	6
architecture	42	2	16	17	30	14	21	3	5	3	4	5
religion	13	27	27	5	2	3	21	4	24	5	24	12
nature	71	27	41	19	40	6	20	2	18	2	11	3

B5-8 The average Selected times by each category of cultural features

Responses from Western participants
(ratio of each cultural feaure)

Descriptors (%) / Cultural features	attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
handwriting and painting	24	2	11	6	11	6	13	1	13	3	8	4
printing and paper cutting	25	5	13	10	11	3	8	1	8	4	9	3
origami	25	7	13	9	16	2	8	2	8	3	4	3
utensils and objects	21	6	10	7	14	6	9	2	12	4	4	3
customs	21	13	16	6	6	3	6	3	9	4	7	5
food	19	18	21	6	8	2	7	1	9	1	5	3
architecture	26	1	10	10	19	9	13	2	3	2	2	3
religion	8	16	16	3	1	2	13	2	14	3	14	7
nature	27	10	16	7	15	2	8	1	7	1	4	1

B5-9 The average of Selected times for each emotion descriptor

Responses from Western participants
(ticked times devided by numbers of products in each category)

Descriptors / Cultural features	attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
handwriting and painting	19.3	1.3	8.8	5.2	8.8	4.7	10.3	0.7	10.5	2.5	6.8	3.2
printing and paper cutting	22.7	4.7	12.0	9.2	10.0	2.7	7.0	0.5	7.5	3.2	8.3	2.7
origami	23.3	6.7	12.6	8.7	15.0	1.7	7.6	1.7	7.9	3.1	4.0	2.4
utensils and objects	19.3	5.1	9.6	6.6	13.0	5.6	8.4	2.3	11.4	4.0	4.1	3.0
customs	20.8	12.8	15.6	6.4	6.4	3.2	5.6	2.8	9.2	4.4	6.8	4.8
food	18.0	17.5	20.5	5.5	7.5	2.0	7.0	0.5	8.5	1.0	5.0	3.0
architecture	21.0	1.0	8.0	8.5	15.0	7.0	10.5	1.5	2.5	1.5	2.0	2.5
religion	6.5	13.5	13.5	2.5	1.0	1.5	10.5	2.0	12.0	2.5	12.0	6.0
nature	23.7	9.0	13.7	6.3	13.3	2.0	6.7	0.7	6.0	0.7	3.7	1.0

B5-10 The percentage of the Selected times for each emotion descriptor

Responses from Western participants
(percentage of every emotion descriptor)

Descriptors (%) / Cultural features	attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
handwriting and painting	11.1	1.9	7.7	8.8	9.8	15.4	14.0	5.3	13.9	10.9	12.9	11.1
printing and paper cutting	13.0	6.5	10.5	15.6	11.1	8.8	9.5	4.0	9.9	13.8	15.8	9.3
origami	13.3	9.4	11.0	14.8	16.6	5.7	10.3	13.6	10.4	13.7	7.6	8.5
utensils and objects	11.1	7.2	8.4	11.2	14.4	18.4	11.5	18.1	15.1	17.5	7.8	10.5
customs	11.9	17.9	13.7	10.9	7.1	10.6	7.6	22.2	12.2	19.2	12.9	16.8
food	10.3	24.4	18.0	9.3	8.3	6.6	9.5	4.0	11.3	4.4	9.5	10.5
architecture	12.0	1.4	7.0	14.4	16.6	23.1	14.3	11.9	3.3	6.6	3.8	8.7
religion	3.7	18.8	11.8	4.2	1.1	5.0	14.3	15.9	15.9	10.9	22.7	21.0
nature	13.6	12.6	12.0	10.8	14.8	6.6	9.1	5.3	7.9	2.9	6.9	3.5

B6. Results from emotional descriptors by every cultural product

B6-1 A framework of the Selected times of emotional descriptors in every cultural product

Descriptors / Sample		Positive descriptors	Negative descriptors
Cultural feature			
East	Product serial number	ticked times of emotion descriptor on the product	
West			

B6-2 Selected times of emotional descriptors in every cultural product from Eastern and Western responses in ORIGAMI category.

Descriptors / Sample serial number		Positive descriptors						Negative descriptors					
		attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
Origami													
East	13	61	7	10	21	30	1	9	1	13	0	1	0
	14	49	10	10	29	39	0	6	0	17	4	1	0
	15	61	14	30	31	27	1	4	1	4	1	1	1
	16	26	33	31	30	7	0	6	0	17	1	6	1
	17	56	31	33	27	14	9	9	0	3	0	1	0
	18	37	13	4	24	11	3	17	1	7	1	9	0
	19	53	9	1	24	61	7	6	0	1	1	0	0
West	13	40	6	20	13	27	1	7	0	13	4	1	0
	14	30	7	17	16	44	3	7	6	20	9	1	10
	15	44	10	24	14	20	3	10	0	6	6	3	4
	16	26	23	19	10	3	1	10	3	16	6	11	1
	17	31	16	26	16	10	3	10	1	7	1	10	3
	18	20	1	3	6	11	0	26	7	13	4	7	6
	19	41	4	17	13	34	6	6	0	4	1	6	0

B6-3 Selected times of emotional descriptors in every cultural product from Eastern and Western responses in FOOD category.

Descriptors / Sample		Positive descriptors						Negative descriptors					
		attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
Food													
East	32	30	40	47	23	6	0	13	0	3	0	17	0
	33	47	31	36	16	13	9	7	0	4	0	3	0
West	32	21	46	40	7	1	0	13	1	14	3	10	6
	33	30	4	19	9	20	6	7	0	10	0	4	3

B6-4 Selected times of emotional descriptors in every cultural product from Eastern and Western responses in in RELIGION category.

Descriptors / Sample serial number		Positive descriptors						Negative descriptors					
		attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
Religion													
East	36	16	24	14	7	1	0	30	16	20	10	9	3
	37	30	40	40	14	1	13	11	3	6	1	7	3
West	36	9	10	17	4	1	1	17	3	20	4	19	11
	37	10	29	21	3	1	3	13	3	14	3	16	6

B6-5 Selected times of emotional descriptors in every cultural product from Eastern and Western responses in ARCHITECTURE category.

Descriptors / Sample serial number		Positive descriptors						Negative descriptors					
		attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
Architecture													
East	34	49	10	7	39	20	14	7	1	9	6	3	3
	35	43	10	7	36	21	26	4	1	11	0	3	1
West	34	31	3	10	7	26	6	19	3	3	3	1	4
	35	29	0	13	17	17	14	11	1	4	1	4	3

B6-6 Selected times of emotional descriptors in every cultural product from Eastern and Western responses in CUSTOMS category.

Descriptors / Sample serial number		Positive descriptors						Negative descriptors					
		attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
Customs													
East	27	59	41	49	19	7	19	3	3	3	0	9	3
	28	20	17	16	20	4	3	26	3	14	10	3	4
	29	40	41	40	31	1	0	4	0	6	3	4	3
	30	36	24	13	23	17	13	3	1	17	0	3	0
	31	26	7	4	26	26	10	20	1	10	3	9	1
West	27	30	43	31	16	16	6	6	3	3	1	10	3
	28	21	9	16	7	4	7	17	9	20	13	6	11
	29	39	29	40	11	1	6	1	1	7	3	7	6
	30	29	10	11	1	10	4	7	4	23	6	19	6
	31	30	1	13	10	14	0	9	3	13	9	7	9

B6-7 Selected times of emotional descriptors in every cultural product from Eastern and Western responses in PRINTING and PAPER CUTTING category.

Descriptors / Sample		Positive descriptors						Negative descriptors					
		attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
Printing and paper cutting													
East	7	27	3	4	29	10	29	20	3	13	0	21	3
	8	46	14	14	27	34	30	14	0	9	1	1	1
	9	4	16	4	14	7	40	36	0	4	1	9	1
	10	47	16	20	46	29	4	11	0	11	7	3	0
	11	46	7	3	29	16	13	3	0	6	0	9	0
	12	63	40	31	29	16	33	3	0	9	1	0	0
West	7	21	3	14	7	7	3	13	1	13	4	31	3
	8	40	7	16	14	17	6	3	1	7	3	4	3
	9	24	0	4	7	3	3	23	0	7	0	17	7
	10	34	11	21	26	26	1	7	0	19	11	7	4
	11	36	6	21	13	16	1	7	0	6	1	7	1
	12	39	13	26	11	17	9	7	1	13	7	4	4

B6-8 Selected times of emotional descriptors in every cultural product from Eastern and Western responses in UTENSILS and OBJECTS category.

Descriptors / Sample		Positive descriptors						Negative descriptors					
		attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
Utensils and objects													
East	20	90	20	24	63	10	17	20	3	41	0	19	0
	21	46	9	19	27	23	1	7	1	43	4	3	0
	22	39	11	23	20	39	24	11	1	10	4	6	1
	23	29	1	3	30	66	11	7	0	11	1	6	1
	24	30	3	1	20	24	36	21	0	6	0	9	1
	25	50	20	20	34	17	0	7	0	13	1	7	0
	26	44	23	29	19	4	37	10	0	6	0	7	0
West	20	33	13	13	13	11	6	11	6	20	7	4	3
	21	29	9	17	9	14	0	9	7	39	11	3	10
	22	20	7	11	7	20	17	11	3	10	6	9	4
	23	23	3	11	11	41	6	13	3	24	7	1	6
	24	16	0	9	4	16	14	23	0	3	1	10	3
	25	47	10	16	13	21	1	7	4	11	4	4	1
	26	26	10	19	9	6	11	10	0	7	3	10	3

B6-9 Selected times of emotional descriptors in every cultural product from Eastern and Western responses in HANDWRITING and PAINTING category.

Descriptors / Sample serial number		Positive descriptors						Negative descriptors					
		attractive	humorous	amused	self-expression	luxurious	nostalgia	bored	angry	confused	anxious	cheap	pessimistic
Handwriting and painting													
East	1	40	4	1	29	6	21	20	0	9	0	9	0
	2	23	6	3	20	16	19	24	0	27	4	3	1
	3	26	6	0	14	9	34	21	0	11	3	9	1
	4	41	6	6	21	29	7	19	0	11	0	4	0
	5	6	3	7	0	7	3	13	4	34	14	17	10
	6	20	0	1	16	9	33	33	1	4	0	17	3
West	1	40	1	6	7	7	6	13	1	9	4	20	4
	2	23	3	21	9	14	1	10	1	20	3	4	3
	3	27	0	10	11	10	9	19	1	14	3	4	3
	4	31	1	16	6	21	1	21	0	19	4	1	3
	5	20	4	10	0	13	0	6	1	26	7	10	9
	6	24	1	13	11	10	23	20	0	3	0	19	6

B7 Results from emotional descriptors by age range

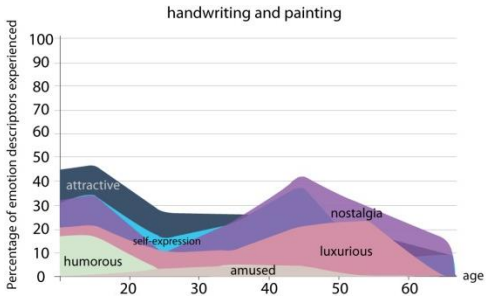
B7-1 A framework of the result presentation.

Cultural feature			
East	Emotion descriptors / Age	Positive emotion descriptors	Negative emotion descriptors
	Age Range	Numbers of ticked times	
	Age Range	percentage of the ticked times	
West	Emotion descriptors / Age	Positive emotion descriptors	Negative emotion descriptors
	Age Range	Numbers of ticked times	
	Age Range	percentage of the ticked times	

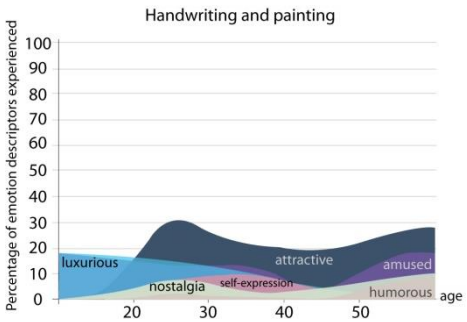
B7-2 Selected times and the percentage of Handwriting and Painting -inspired products by ages

Handwriting and painting													
East	Emotion descriptors / Age	Positive response						Negative response					
		primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
	under19	11	4	0	8	5	8	5	0	1	0	2	1
	20-29	39	3	5	23	18	14	33	3	23	6	17	4
	30-39	49	9	7	41	20	43	36	1	39	9	20	6
	40-49	6	1	1	9	5	10	2	0	1	0	0	0
	50-59	3	0	0	1	4	5	1	0	1	0	2	0
	above 60	1	0	0	1	0	2	1	0	3	0	0	0
		percentage (by propotion)											
	under19	46	17	0	33	21	33	21	0	4	0	8	4
	20-29	26	2	3	15	12	9	22	2	15	4	11	3
	30-39	26	5	4	21	10	22	19	1	20	5	10	3
	40-49	25	4	4	38	21	42	8	0	4	0	0	0
	50-59	17	0	0	6	22	28	6	0	6	0	11	0
	above 60	8	0	0	8	0	17	8	0	25	0	0	0
West	Emotion descriptors / Age	primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
	under19	0	0	2	0	3	0	0	0	0	0	0	0
	20-29	109	29	55	39	67	11	39	12	36	21	25	11
	30-39	40	15	24	12	30	0	10	0	7	1	0	6
	40-49	10	3	4	10	5	1	3	0	8	0	3	0
	50-59	4	0	3	0	0	0	1	0	4	0	0	0
	above 60	0	0	0	0	0	0	0	0	0	0	0	0
		percentage (by propotion)											
	under19	0	0	29	0	43	0	0	0	0	0	0	0
	20-29	35	9	18	13	22	4	13	4	12	7	8	4
	30-39	38	14	23	11	29	0	10	0	7	1	0	6
	40-49	18	5	7	18	9	2	5	0	14	0	5	0
	50-59	29	0	21	0	0	0	7	0	29	0	0	0
	above 60	0	0	0	0	0	0	0	0	0	0	0	0

B7-3 Positive emotions from Handwriting and Painting -inspired products displayed by



Eastern experience

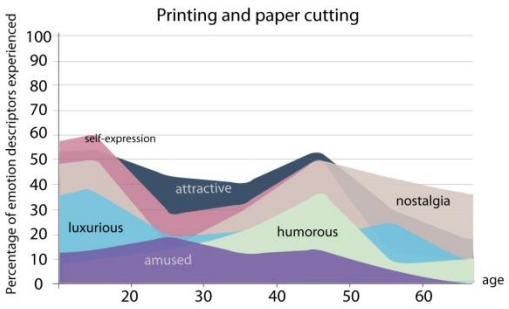


Western experience

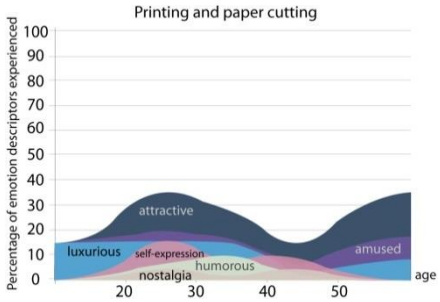
B7-4 Selected times and the percentage of Printing and Paper cutting -inspired products by ages.

Printing and paper cutting													
	Emotion descriptors / Age	Positive response						Negative response					
		primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
East	under19	12	2	3	13	8	11	2	0	2	1	2	0
	20-29	60	18	26	38	25	19	21	1	11	0	14	1
	30-39	72	37	21	56	36	52	31	1	21	7	14	3
	40-49	12	8	3	11	4	11	5	0	1	0	0	0
	50-59	5	1	1	2	4	7	2	0	0	0	0	0
	above 60	2	1	0	1	1	4	0	0	1	0	0	0
		percentage (by propotion)											
	under19	50	8	13	54	33	46	8	0	8	4	8	0
	20-29	40	12	17	25	17	13	14	1	7	0	9	1
	30-39	38	19	11	29	19	27	16	1	11	4	7	2
	40-49	50	33	13	46	17	46	21	0	4	0	0	0
	50-59	28	6	6	11	22	39	11	0	0	0	0	0
	above 60	17	8	0	8	8	33	0	0	8	0	0	0
	Emotion descriptors / Age	primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
West	under19	1	0	1	0	1	0	2	0	0	0	1	0
	20-29	100	18	51	44	43	12	25	1	30	16	36	8
	30-39	25	9	15	7	14	2	9	1	11	2	11	5
	40-49	6	1	3	4	1	2	5	1	3	1	1	2
	50-59	4	0	2	0	1	0	1	0	1	0	1	1
	above 60	0	0	0	0	0	0	0	0	0	0	0	0
		percentage (by propotion)											
	under19	17	0	17	0	17	0	33	0	0	0	17	0
	20-29	38	7	19	17	16	5	9	0	11	6	14	3
	30-39	28	10	17	8	16	2	10	1	12	2	12	6
	40-49	13	2	6	8	2	4	10	2	6	2	2	4
	50-59	33	0	17	0	8	0	8	0	8	0	8	8
	above 60	0	0	0	0	0	0	0	0	0	0	0	0

B7-5 Positive emotions from Printing and Paper cutting -inspired products displayed by age range



Eastern experience

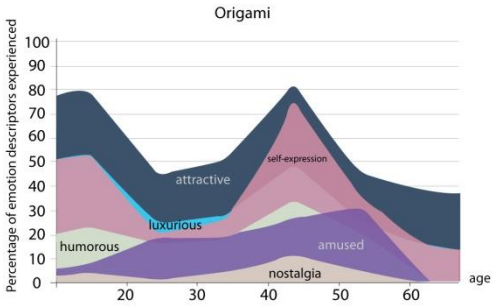


Western experience

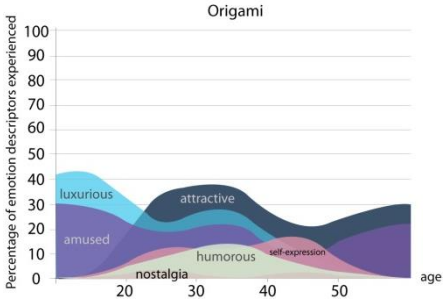
B7-6 Selected times and the percentage of origami-inspired products by ages

Origami													
	Emotion descriptors	Positive response						Negative response					
		primitive data (by ticked-times)											
	Age	Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
East	under19	21	6	2	14	14	1	3	1	0	0	0	0
	20-29	74	26	30	33	40	2	10	0	16	2	5	1
	30-39	109	37	39	55	59	8	24	2	26	5	9	1
	40-49	22	9	7	20	13	3	1	0	1	0	0	0
	50-59	9	4	6	7	5	1	1	0	0	0	0	0
	above 60	5	0	0	2	2	0	0	0	1	0	0	0
		percentage (by propotion)											
	under19	75	21	7	50	50	4	11	4	0	0	0	0
	20-29	42	15	17	19	23	1	6	0	9	1	3	1
	30-39	49	17	17	25	26	4	11	1	12	2	4	0
	40-49	79	32	25	71	46	11	4	0	4	0	0	0
	50-59	43	19	29	33	24	5	5	0	0	0	0	0
	above 60	36	0	0	14	14	0	0	0	7	0	0	0
	Emotion descriptors	primitive data (by ticked-times)											
	Age	Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
West	under19	0	0	2	0	3	0	0	0	0	0	0	0
	20-29	109	29	55	39	67	11	39	12	36	21	25	11
	30-39	40	15	24	12	30	0	10	0	7	1	0	6
	40-49	10	3	4	10	5	1	3	0	8	0	3	0
	50-59	4	0	3	0	0	0	1	0	4	0	0	0
	above 60	0	0	0	0	0	0	0	0	0	0	0	0
		percentage (by propotion)											
	under19	0	0	29	0	43	0	0	0	0	0	0	0
	20-29	35	9	18	13	22	4	13	4	12	7	8	4
	30-39	38	14	23	11	29	0	10	0	7	1	0	6
	40-49	18	5	7	18	9	2	5	0	14	0	5	0
	50-59	29	0	21	0	0	0	7	0	29	0	0	0
	above 60	0	0	0	0	0	0	0	0	0	0	0	0

B7-7 Positive emotions from Origami-inspired products displayed by age range



Eastern experience

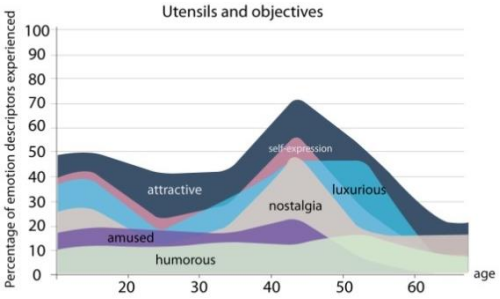


Western experience

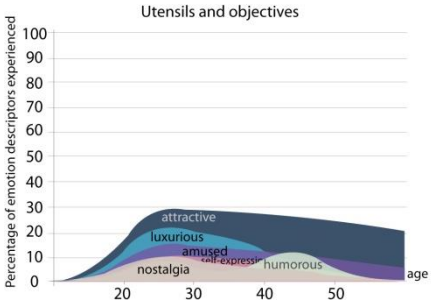
B7-8 Selected times and the percentage of Utensils and Objects-inspired products by ages

Utensils and objects													
	Emotion descriptors / Age	Positive response						Negative response					
		primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
East	under19	13	3	5	11	10	7	5	0	1	0	2	0
	20-29	66	17	29	36	27	18	18	2	25	3	11	2
	30-39	87	27	34	59	66	40	23	1	43	5	20	1
	40-49	19	3	6	15	12	13	1	0	3	0	0	0
	50-59	10	3	1	5	9	3	3	0	2	0	0	0
	above 60	3	1	0	1	1	2	2	0	3	0	0	0
	percentage (by propotion)												
	under19	46	11	18	39	36	25	18	0	4	0	7	0
	20-29	38	10	17	21	15	10	10	1	14	2	6	1
	30-39	39	12	15	26	29	18	10	0	19	2	9	0
	40-49	68	11	21	54	43	46	4	0	11	0	0	0
	50-59	48	14	5	24	43	14	14	0	10	0	0	0
	above 60	21	7	0	7	7	14	14	0	21	0	0	0
	Emotion descriptors / Age	primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
West	under19	0	0	0	0	0	0	0	0	2	0	0	1
	20-29	89	25	46	33	69	31	35	14	53	26	20	13
	30-39	29	4	14	9	18	6	16	2	17	2	7	6
	40-49	14	7	6	4	4	2	7	0	5	0	2	0
	50-59	3	0	1	0	0	0	1	0	3	0	0	1
	above 60	0	0	0	0	0	0	0	0	0	0	0	0
	percentage (by propotion)												
	under19	0	0	0	0	0	0	0	0	29	0	0	14
	20-29	29	8	15	11	22	10	11	5	17	8	6	4
	30-39	28	4	13	9	17	6	15	2	16	2	7	6
	40-49	25	13	11	7	7	4	13	0	9	0	4	0
	50-59	21	0	7	0	0	0	7	0	21	0	0	7
	above 60	0	0	0	0	0	0	0	0	0	0	0	0

B7-9 Positive emotions from Utensils and objects -inspired products displayed by age range



Eastern experience

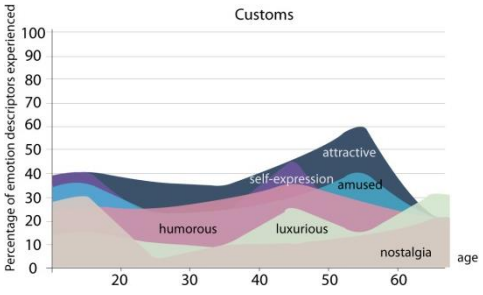


Western experience

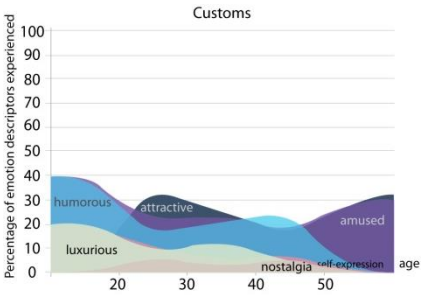
B7-10 Selected times and the percentage of Customs-inspired products by ages

Customs													
	Emotion descriptors / Age	Positive response						Negative response					
		primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
East	under19	8	5	7	8	3	6	1	0	0	0	2	0
	20-29	44	30	28	26	12	4	13	5	8	3	7	0
	30-39	54	44	36	36	14	15	22	1	22	8	10	8
	40-49	9	7	6	9	5	2	3	0	5	0	0	0
	50-59	9	4	6	2	2	2	0	0	0	0	0	0
	above 60	2	2	2	2	3	2	0	0	0	0	0	0
	percentage (by propotion)												
	under19	40	25	35	40	15	30	5	0	0	0	10	0
	20-29	35	24	22	21	10	3	10	4	6	2	6	0
	30-39	34	28	23	23	9	9	14	1	14	5	6	5
	40-49	45	35	30	45	25	10	15	0	25	0	0	0
	50-59	60	27	40	13	13	13	0	0	0	0	0	0
	above 60	20	20	20	20	30	20	0	0	0	0	0	0
West	Emotion descriptors / Age	primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
	under19	0	2	2	1	1	0	1	0	0	0	0	0
	20-29	77	36	48	24	19	12	18	11	37	19	21	11
	30-39	18	16	18	4	10	2	7	2	5	3	9	8
	40-49	6	10	7	3	2	2	1	1	2	0	4	5
	50-59	3	0	3	0	0	0	1	0	2	0	0	0
	above 60	0	0	0	0	0	0	0	0	0	0	0	0
	percentage (by propotion)												
	under19	0	40	40	20	20	0	20	0	0	0	0	0
	20-29	35	16	22	11	9	5	8	5	17	9	10	5
	30-39	24	21	24	5	13	3	9	3	7	4	12	11
	40-49	15	25	18	8	5	5	3	3	5	0	10	13
	50-59	30	0	30	0	0	0	10	0	20	0	0	0
	above 60	0	0	0	0	0	0	0	0	0	0	0	0

B7-11 Positive emotions from Customs-inspired products displayed by age range



Eastern experience

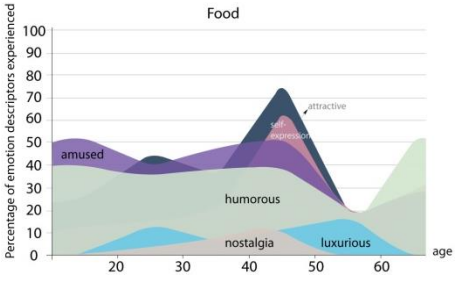


Western experience

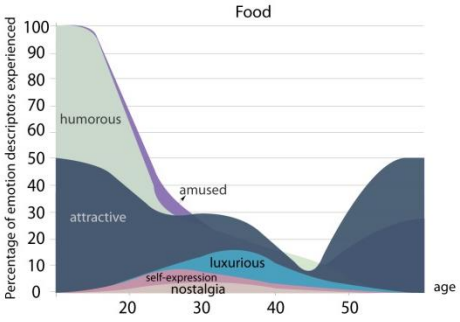
B7-12 Selected times and the percentage of Food-inspired products by ages

Food													
	Emotion descriptors / Age	Positive response						Negative response					
		primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
East	under19	2	3	4	1	0	0	2	0	0	0	1	0
	20-29	22	17	19	7	7	1	3	0	0	0	2	0
	30-39	22	24	30	12	4	4	7	0	4	0	10	0
	40-49	6	3	4	5	1	1	0	0	1	0	1	0
	50-59	1	1	1	1	1	0	2	0	0	0	0	0
	above 60	1	2	0	1	0	0	0	0	0	0	0	0
	percentage (by propotion)												
	under19	25	38	50	13	0	0	25	0	0	0	13	0
	20-29	44	34	38	14	14	2	6	0	0	0	4	0
	30-39	34	38	47	19	6	6	11	0	6	0	16	0
	40-49	75	38	50	63	13	13	0	0	13	0	13	0
	50-59	17	17	17	17	17	0	33	0	0	0	0	0
	above 60	25	50	0	25	0	0	0	0	0	0	0	0
	Emotion descriptors / Age	primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
West	under19	1	2	2	0	0	0	0	0	0	0	1	0
	20-29	24	26	33	8	9	3	7	1	13	1	7	4
	30-39	9	6	5	2	5	1	4	0	1	0	3	2
	40-49	1	2	1	0	1	0	3	0	3	1	0	0
	50-59	2	0	1	0	0	0	0	0	0	0	0	0
	above 60	0	0	0	0	0	0	0	0	0	0	0	0
	percentage (by propotion)												
	under19	50	100	100	0	0	0	0	0	0	0	50	0
	20-29	27	30	38	9	10	3	8	1	15	1	8	5
	30-39	30	20	17	7	17	3	13	0	3	0	10	7
	40-49	6	13	6	0	6	0	19	0	19	6	0	0
	50-59	50	0	25	0	0	0	0	0	0	0	0	0
	above 60	0	0	0	0	0	0	0	0	0	0	0	0

B7-13 Positive emotions from Food-inspired products displayed by ages



Eastern experience

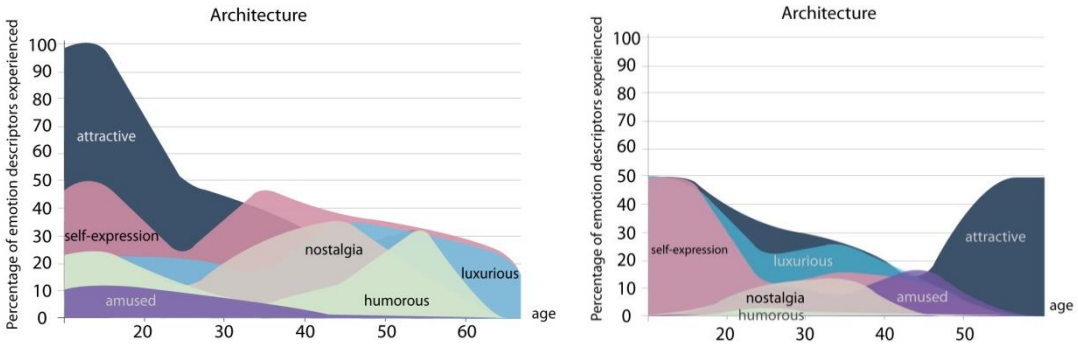


Western experience

B7-14 Selected times and the percentage of Architecture-inspired products by ages

Architecture													
	Emotion descriptors / Age	Positive response						Negative response					
		primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
East	under19	8	2	1	4	2	2	0	0	0	0	0	0
	20-29	25	6	5	11	11	5	1	0	3	2	0	2
	30-39	26	3	4	31	11	17	4	2	10	2	3	1
	40-49	2	1	0	3	3	3	1	0	1	0	0	0
	50-59	2	2	0	2	2	1	1	0	0	0	0	0
	above 60	1	0	0	1	0	0	1	0	0	0	1	0
	percentage (by propotion)												
	under19	100	25	13	50	25	25	0	0	0	0	0	0
	20-29	50	12	10	22	22	10	2	0	6	4	0	4
	30-39	41	5	6	48	17	27	6	3	16	3	5	2
	40-49	25	13	0	38	38	38	13	0	13	0	0	0
	50-59	33	33	0	33	33	17	17	0	0	0	0	0
	above 60	25	0	0	25	0	0	25	0	0	0	25	0
	Emotion descriptors / Age	primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
West	under19	1	0	0	1	1	0	0	0	0	0	0	0
	20-29	29	2	11	9	19	10	14	2	4	3	3	4
	30-39	8	0	2	5	8	4	5	0	1	0	0	1
	40-49	2	0	3	2	2	0	1	0	0	0	1	0
	50-59	2	0	0	0	0	0	1	1	0	0	0	0
	above 60	0	0	0	0	0	0	0	0	0	0	0	0
	percentage (by propotion)												
	under19	50	0	0	50	50	0	0	0	0	0	0	0
	20-29	33	2	13	10	22	11	16	2	5	3	3	5
	30-39	27	0	7	17	27	13	17	0	3	0	0	3
	40-49	13	0	19	13	13	0	6	0	0	0	6	0
	50-59	50	0	0	0	0	0	25	25	0	0	0	0
	above 60	0	0	0	0	0	0	0	0	0	0	0	0

B7-15 Positive emotions from Architecture-inspired products displayed by age range



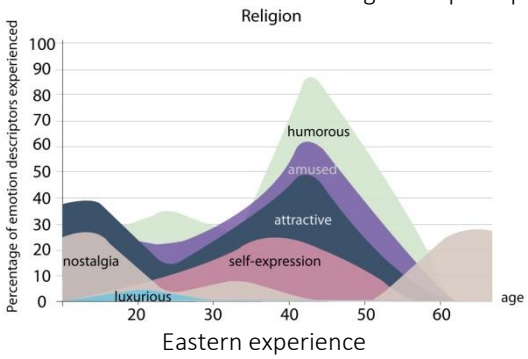
Eastern experience

Western experience

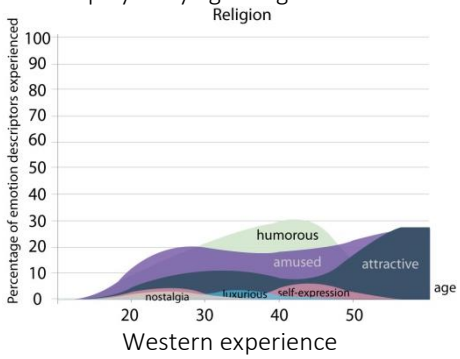
B7-16 Selected times and the percentage of Religion products by ages

Religion													
	Emotion descriptors / Age	Positive response						Negative response					
		primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
East	under19	3	2	2	0	0	2	2	0	0	0	0	0
	20-29	6	17	10	3	2	1	11	5	5	4	6	3
	30-39	18	16	19	9	0	5	14	8	13	4	5	1
	40-49	4	7	5	2	0	0	1	0	0	0	0	0
	50-59	1	3	2	1	0	0	0	0	0	0	0	0
	above 60	0	0	0	0	0	1	1	0	0	0	0	0
	percentage (by propotion)												
	under19	38	25	25	0	0	25	25	0	0	0	0	0
	20-29	12	34	20	6	4	2	22	10	10	8	12	6
	30-39	28	25	30	14	0	8	22	13	20	6	8	2
	40-49	50	88	63	25	0	0	13	0	0	0	0	0
	50-59	17	50	33	17	0	0	0	0	0	0	0	0
	above 60	0	0	0	0	0	25	25	0	0	0	0	0
	Emotion descriptors / Age	primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
West	under19	0	0	0	0	0	0	0	0	0	0	0	0
	20-29	8	14	18	4	1	3	16	3	18	4	16	6
	30-39	3	8	5	0	1	0	3	1	5	1	6	4
	40-49	1	5	3	1	0	0	2	0	0	0	2	2
	50-59	1	0	1	0	0	0	0	0	1	0	0	0
	above 60	0	0	0	0	0	0	0	0	0	0	0	0
	percentage (by propotion)												
	under19	0	0	0	0	0	0	0	0	0	0	0	0
	20-29	9	16	20	5	1	3	18	3	20	5	18	7
	30-39	10	27	17	0	3	0	10	3	17	3	20	13
	40-49	6	31	19	6	0	0	13	0	0	0	13	13
	50-59	25	0	25	0	0	0	0	0	25	0	0	0
	above 60	0	0	0	0	0	0	0	0	0	0	0	0

B7-17 Positive emotions from Religion-inspired products displayed by age range



Eastern experience

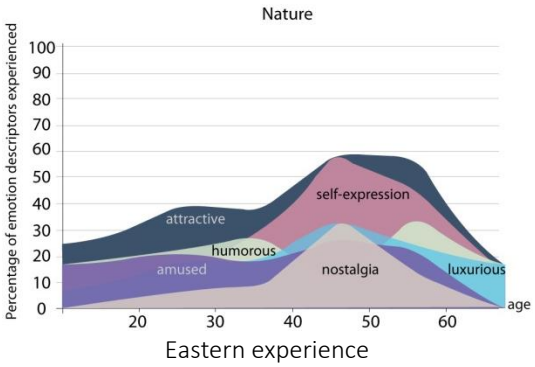


Western experience

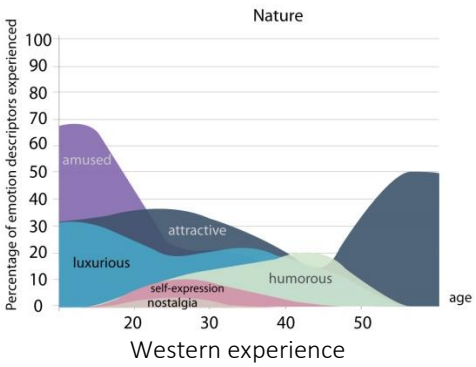
B7-18 Selected times and the percentage of Nature-inspired products by ages

Nature													
	Emotion descriptors / Age	Positive response						Negative response					
		primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
East	under19	3	2	2	1	1	0	0	0	0	0	4	0
	20-29	29	16	15	10	13	4	10	0	5	1	1	0
	30-39	35	26	16	27	17	8	11	0	9	0	15	1
	40-49	7	1	3	7	4	4	1	0	0	0	0	0
	50-59	5	3	2	4	2	1	0	0	0	0	0	0
	above 60	1	1	0	1	1	0	0	0	1	0	0	0
	percentage (by propotion)												
	under19	25	17	17	8	8	0	0	0	0	0	33	0
	20-29	39	21	20	13	17	5	13	0	7	1	1	0
	30-39	36	27	17	28	18	8	11	0	9	0	16	1
	40-49	58	8	25	58	33	33	8	0	0	0	0	0
	50-59	56	33	22	44	22	11	0	0	0	0	0	0
	above 60	17	17	0	17	17	0	0	0	17	0	0	0
	Emotion descriptors / Age	primitive data (by ticked-times)											
		Attractive	Humorous	Amused	Self-expression	Luxurious	Nostalgia	Bored	Angry	Confused	Anxious	Cheap	Pessimistic
West	under19	0	0	0	0	0	0	0	0	0	0	0	0
	20-29	8	14	18	4	1	3	16	3	18	4	16	6
	30-39	3	8	5	0	1	0	3	1	5	1	6	4
	40-49	1	5	3	1	0	0	2	0	0	0	2	2
	50-59	1	0	1	0	0	0	0	0	1	0	0	0
	above 60	0	0	0	0	0	0	0	0	0	0	0	0
	percentage (by propotion)												
	under19	0	0	0	0	0	0	0	0	0	0	0	0
	20-29	9	16	20	5	1	3	18	3	20	5	18	7
	30-39	10	27	17	0	3	0	10	3	17	3	20	13
	40-49	6	31	19	6	0	0	13	0	0	0	13	13
	50-59	25	0	25	0	0	0	0	0	25	0	0	0
	above 60	0	0	0	0	0	0	0	0	0	0	0	0

B7-19 Positive emotions from Nature-inspired products displayed by age range



Eastern experience



Western experience

Appendix C: reference of the product images

No.	Products	Designer(s) or company / source link
1		Key Ring by Taiwan goods http://www.taiwangoods.com.tw/shop.php?id=10215&factory=&header=&ctype2=&typeid=&pagename=&Fno=&date_buy= (retrieved by 18 November, 2012)
2		Scanner by BenQ Scanner 5250C http://news.mydrivers.com/blog/20031110.htm (retrieved by 18 November, 2012)
3		Placemat By National Palace Museum http://www.npmshops.com/main/modules/MySpace/PrdInfo.php?sn=npmshops&pc=2116042020008 (retrieved by 22 Feb, 2013)
4		Calligraphy cutlery by JIA Inc http://113.196.121.130/iccie/award_previous.php?act=view&no=12 (retrieved by 22 November, 2012)
5		Necklace by Iattric http://www.iattric.com/ (retrieved by 12 October, 2012)
6	Mug 	By National Palace Museum / http://www.npmshops.com/main/modules/MySpace/index.php?sel=prdall&ss=%u99AC%u514B%u676F (retrieved by 22 Feb, 2013)
7		Watch

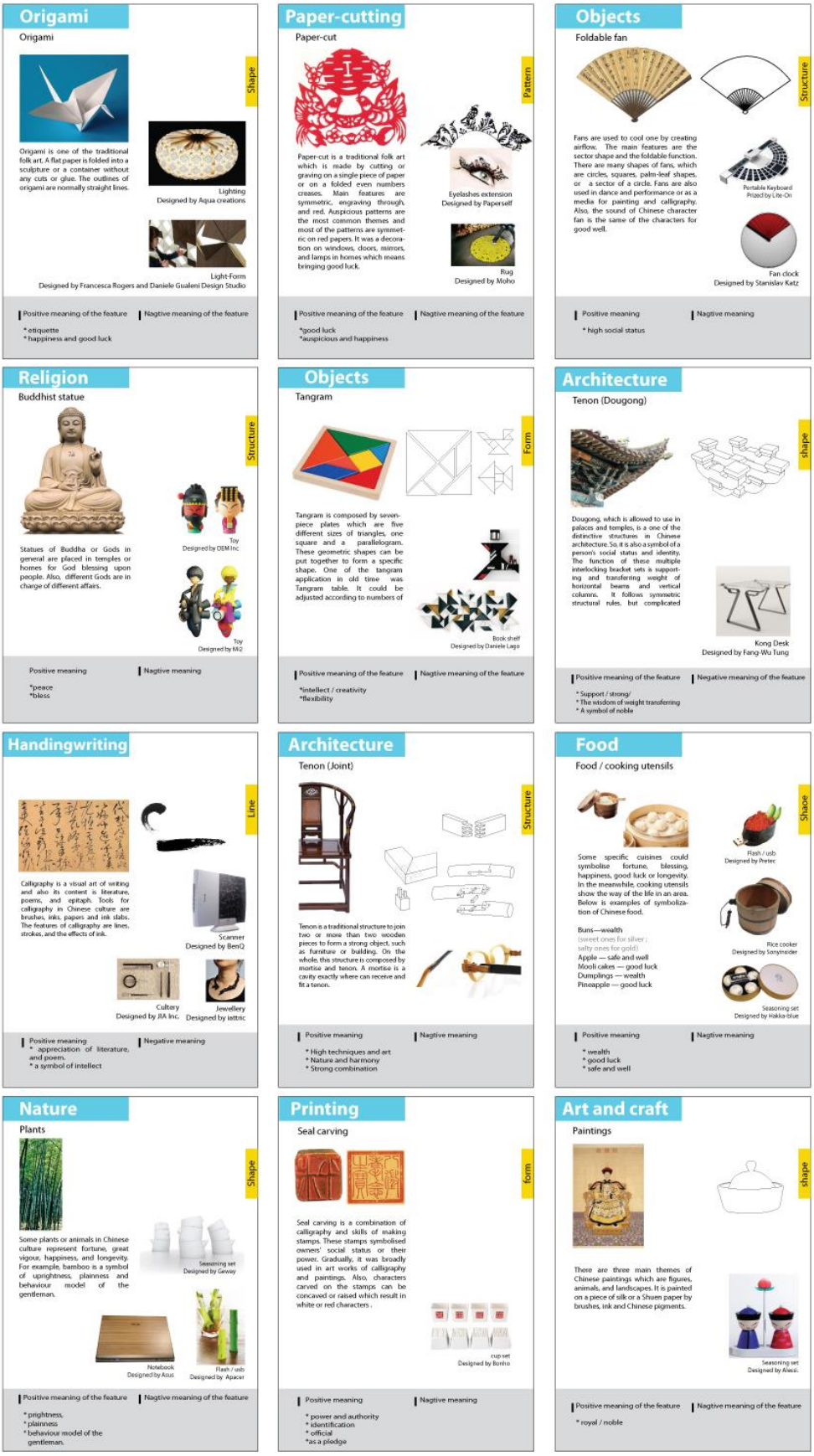
8		Cups by BONHO Inc. http://www.bonho.com.tw/cup.html (retrieved by 20 Jan, 2013)
9		Keychain by National Palace Museum http://www.npmshops.com/main/modules/MySpace/PrdInfo.php?sn=npmshops&cn=ZC537955&pc=3403331420002 (retrieved by 24 Feb, 2013)
10		Extended eyelashes by Paperself http://www.paperselfstore.com/ (retrieved by 2 Mar, 2013)
11		Rugs by Moho Design http://mohodesign.com/produkty/dia_aranzacja_1eng
12		Tea bag by Yi-Shan Hsieh (Recognized with iF concept design award 2012) http://exhibition.ifdesign.de/entrydetails_en.html?mode=esearch&offset=0 (retrieved by 12 Jan, 2013)
13		Light form by Francesca Rogers in cooperation with Daniele Gualeni Design Studio / http://www.designrulz.com/product-design/light/2012/05/modern-wall-light-design-light-form-by-francesca-rogers-and-daniele-gualeni/ (retrieved by 15 May, 2013)
14		Origami Iceland (Kitchen sink) by Karim Rashid http://www.kitcheninstallation.org/kitchen-design/origami-iceland-kitchen-design.html (retrieved by 3 March, 2013)
15		A Chair by Kale http://www.kale.com.tr/en-us/trends?recid=234 (retrieved by 5 Jan, 2013)

16		Origami Rabbit Style Speaker by I-mu http://www.i-mu.com.cn/kxxl/&FrontColumns_navigation01-1332314550111FirstColumnId=49&&productId=69.html
17		Origami Crane Soy Sauce Dispenser http://nerdapproved.com/household/the-ancient-art-of-soy-sauce-folding/
18		Chair by Noguchi http://www.origamisources.com/origami_sightings_architecture_design.htm
19		Lamp by Aqua Creations http://homeloanis.com/2011/09/artistic-and-aesthetic-origami-home-decorating-design/ (retrieved by 3 March, 2013)
20		Clock by Stanislav Katz http://www.designboom.com/design/stanislav-katz/ (retrieved by 19 Feb, 2013)
21		Portable Keyboard by Cai Siling http://www.eprice.com.tw/mobile/news/3117/1/
22		Pencil sharpener by National Palace Museum http://www.npmshops.com/main/modules/MySpace/PrdInfo.php?sn=npmshops&pc=3408530390001 (retrieved by 24 Feb, 2013)
23		Cell phone by Vertu http://k-tai.impress.co.jp/docs/news/20100325_356775.html (retrieved by 26 Feb, 2013)
24		Keyrchain by Keda Material http://jxkeda.b2bage.com/product-key-chains/741307/christmas-blue-and-white-porcelain-keychain.html (retrieved by 25 Feb, 2013)

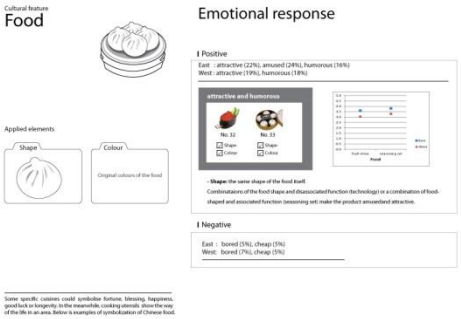
25		Book shelf by Lago http://www.lago.it/en/products/tangram-storage (retrieved by 21 May, 2013)
26		Rice cooker by Masaru Ibuka http://www.sonyinsider.com/2009/03/16/one-of-sonys-first-products-a-rice-cooker/
27		Seasoning set by Alessi http://www.alessi.com/en/products/detail/asg79-mr-mrs-chin-salt-and-pepper-set (retrieved by 19 Jan, 2013)
28		Robot with Beijing opera mask The link of this product was lost.
29		Lantern Signal http://goes54667752.tumblr.com/post/47184670267/japanese-lantern-signal (retrieved by 13 Dec, 2012)
30		Dragon-shape opener / National Palace Museum http://www.npmshops.com/main/modules/MySpace/PrdInfo.php?sn=npmshops&pc=9501031910002 (retrieved by 2 Dec, 2012)
31		Microsoft ArcTM Touch http://big5.xinhuanet.com/gate/big5/news.xinhuanet.com/jiadian/2011-11/22/c_122313744.htm (retrieved by 2 Dec, 2012)
32		i-Disk Sushi (USB Flash drive) by Pretec http://www.pretec.com/products/usb-flash-drives/usb-20-series/item/usb20-style-series/sushi-series (retrieved by 10 Feb, 2013)

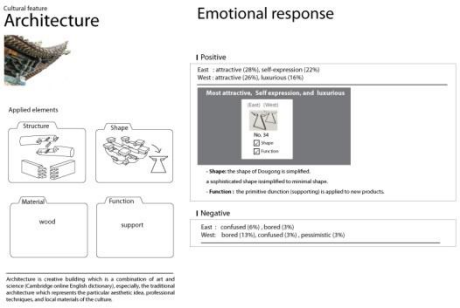
33		Seasoning set by Haka Blue http://www.hakka-blue.com/?FID=44&CID=55 (retrieved by 10 Feb, 2013)
34		Kong Desk by Fang-Wu Tung http://www.ideastorming.tw/explor.php?year=2010&category=3&count=11&ln=ct (retrieved by 10 Jan, 2013)
35		Frame of glasses by Herrlicht http://www.herrlicht.de/ (retrieved by 15 March, 2013)
36		Buddha's Delight Pop House by Mi2 Studio http://www.mi2studio.com/product_info.php?products_id=117 http://www.mi2studio.com/product_info.php?products_id=103 (retrieved by 30 Jan, 2013)
37		“Good god” figure by DEM Inc http://blog.yam.com/sumi0719/article/16581189 (retrieved by 19 Feb, 2013)
38		PIN-CHU cruet set by Geway http://www.geway.net/pinchu_cruet%20set.html
39		Bamboo-shape usb flash by Apacer http://tw.apacer.com/products/AH137
40		Bamboo Series Notebook by Asus http://www.asus.com/Notebooks_Ultrabooks/U6V_Bamboo/

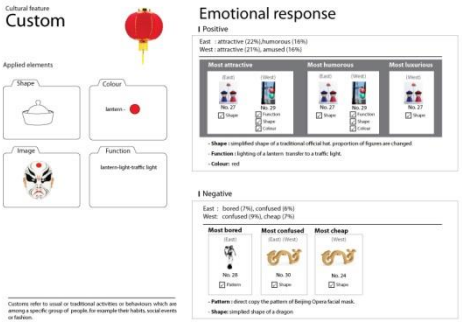
Appendix D: toolkit iteration 1

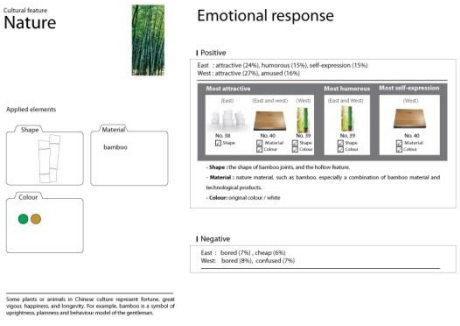


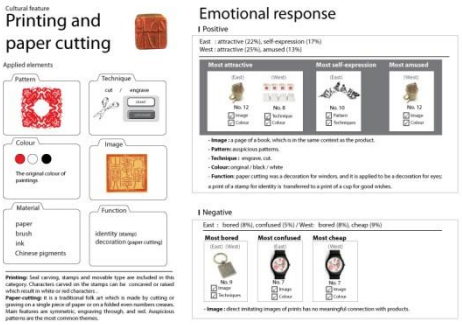
Toolkit iteration 3

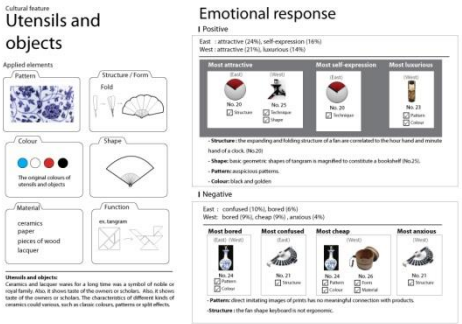


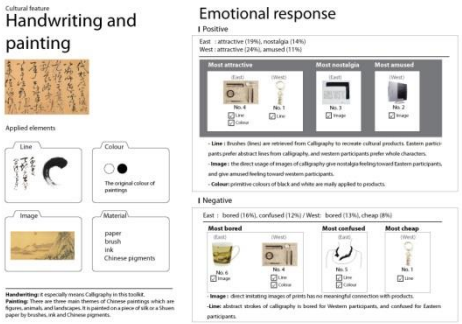


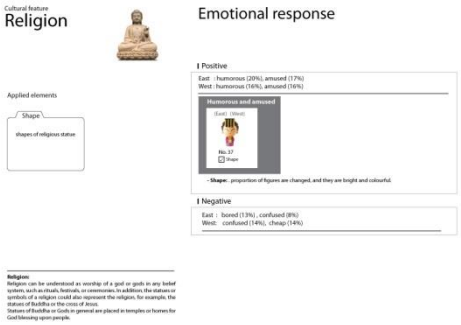




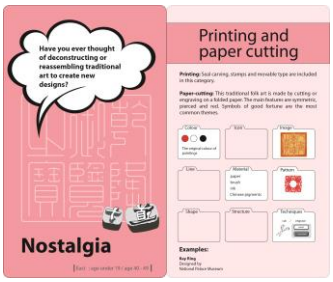


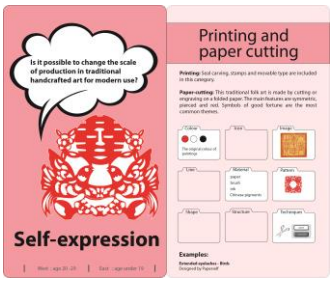


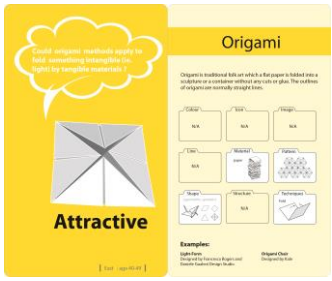


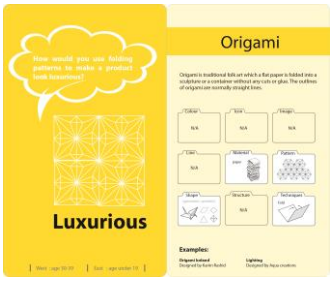


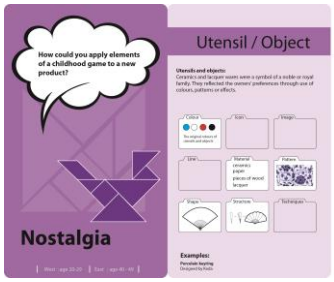
Toolkit iteration 4

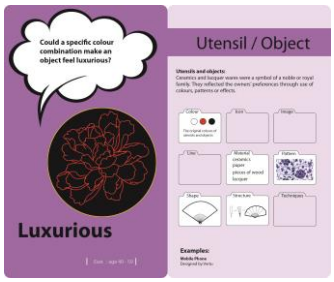


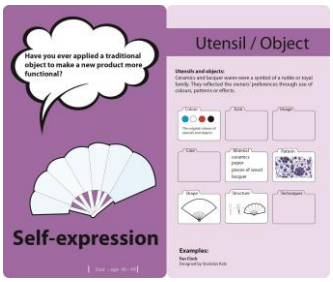


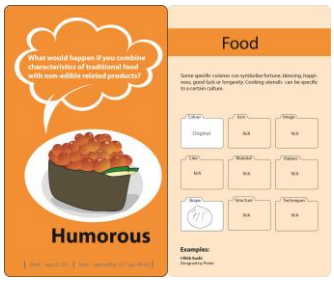


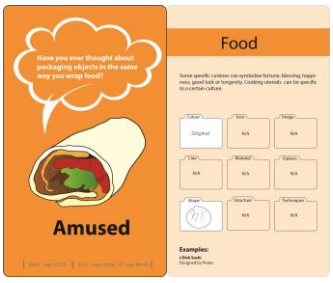


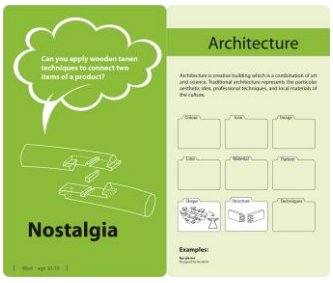


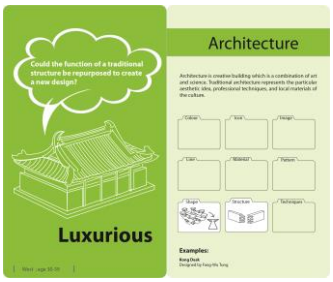


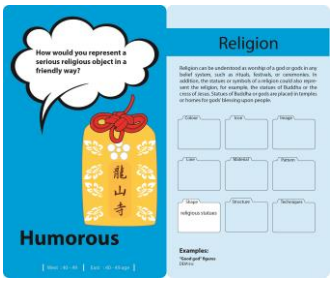




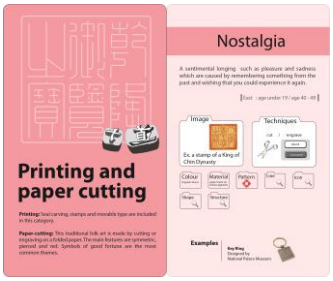


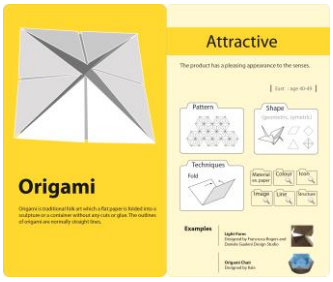


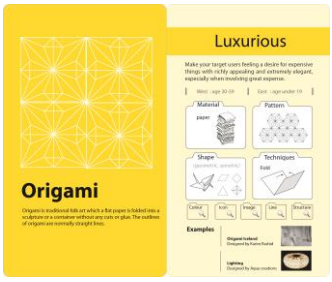


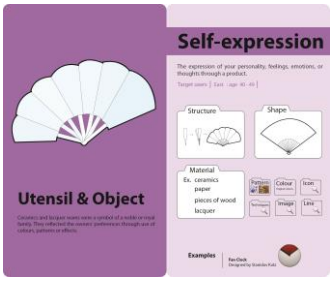


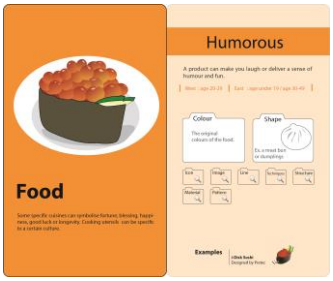
Toolkit final iteration

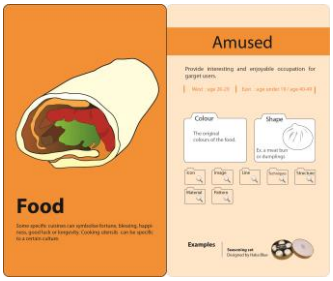


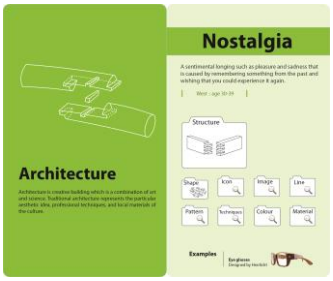


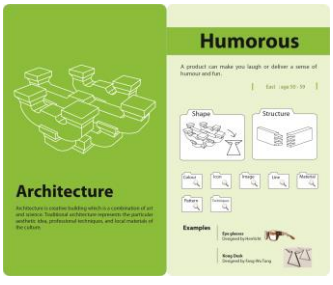


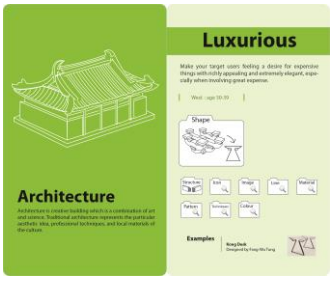


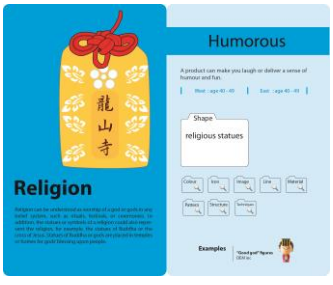












Glossary

Aesthetics An emotional appraisal or appreciation of beauty which is pleasurable to the senses.

Appraisal A process to evaluate the worth, value, meaning of an object.

Brainstorming It is an initial stage of design idea generation which is carried out by a groups of people working together to find solutions for a specific problems.

Card deck A set of design toolkit which is used in the design process.

Cronbach's Alpha A measure of the reliability (Internal Consistency) of a scale. The items should all measure the same underling concept, so they should be correlated with one another.

Cultural feature A visible and artificial character which can represent a culture.

Cultural product A industrial product which carry a cultural feature and can present its cultural identity.

Deconstruction It stems from postmodern architecture in the late 1980s. It is characterised by intentional fragmentation, distortion or dislocation.

Design feature Basic and visual components in any visual design, art or products, such as colour, line, pattern, material or space.

Design method Ways to integrate information via design, such as transformation, abstract, deconstruction principles.

Design model An instructional model tells design processes, design development concepts, strategies or ways to solve problems.

Dotmocracy A method which is used to vote with dot stockers on idea rating sheets.

Emotion A state of feeling, affective consciousness or unconsciousness and mental reaction which has a large number of different mental and physical states.

Emotional descriptor A word used to identity emotional state.

Emotional response An emotional reaction which is generated by both external and internal stimuli.

Feedback Helpful information or criticism that is given by participants such as designers and consumers.

Functionality To provide a useful function which can be served a purpose well.

Gestalt psychology A theory of mind which try to understand the innate

laws of spatial organisation and the human ability to maintain meaningful perceptions.

Globalisation A term refers to the process of interconnectedness and international integration between different countries in the world to interchange products, ideas and cultures.

Icon when the signifier is perceived similar to signified because of resembling or imitating.

Index When a sign is directly related to its meaning, so it can be easily observed, sensed or inferred without learning.

Kolmogorov-Smirnov test A nonparametric test of whether a distribution of scores is significantly different from a normal distribution.

KJ technique It is a group process conducted in silence where participants are provided sticky notes and markers to write down as many as their thoughts of the issue.

Mann-Whitney test A nonparametric test that looks for differences between two independent samples. It is an non-parametric equivalent of independent t-test. It has greater efficiency than the t-test on non-normal distributions

Metaphor It can also be seen as symbol or icon which identifies the unfamiliar by the familiar. Thus the similarity of the two is highlighted.

Non-parametric data when data is measured on nominal or ordinal scale.

Product experience The interaction betweem products, users within an social or environmental context.

Product personality Products which can reflect the owner's personality or social identity.

Product semantics A product which can communicate meaning from designers to users.

Prototype an initial and incomplete design of an application used to evaluate the idea within the developing process.

Reliability The consistency or stability of an approach over time adopted by different researchers many times to the same participants.

Semiotics It is the study of sign and symbolic phenomena which is consisted of semantic, syntactic and pragmatic.

Semantics A relation between signs and the things to which they refer.

Sign A sign is invested with meaning and reference which can be interpreted by users. It stands for something else other than itself. Signs can be presented in words, images, sounds or objects.

Self-expression When an individual desires to be different from other

people and to express his/her personal or social identity.

Symbol An arbitrary or conventional sign representing something else.

Symbolic When a sign only can be understood and interpreted by users who have knowledge of the reference and convention due to its arbitrary nature. Also, it is distinctive from iconic and indexical.

Usability The ease of use of a man-made product. The product could be applications, software, machines, process or anything that human could interact with.

User experience A synthesis of users' internal status and the characteristics of products within a context.

Validity The accuracy of the findings which means a test measures what it set out to measure.

Value A long-lasting belief that an individual or a social group prefer than others