

**DEVELOPMENT OF EMOTIONAL-CULTURAL
DESIGN FRAMEWORK (ECDF) FOR INTERIOR
SPACE WITH SPECIAL EMPHASIS ON THE
NEW CHINESE DECORATIVE STYLE**

LIANG RUI

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DESIGN FRAMEWORK (ECDF) FOR INTERIOR
SPACE WITH SPECIAL EMPHASIS ON THE
NEW CHINESE DECORATIVE STYLE**

by

LIANG RUI

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LIST OF ABBREVIATIONS

USM	Universiti Sains Malaysia
JEPeM	Jawatankuasa Etika Penyelidikan Manusia
ECDF	Emotional-Cultural Design Framework
NCDS	New Chinese Decorative Style
GDP	Gross Domestic Product

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**PEMBANGUNAN KERANGKA REKA BENTUK EMOSI-BUDAYA UNTUK
RUANG DALAMAN DENGAN PENEKANAN KHUSUS PADA
GAYA HIASAN CINA BAHARU**

ABSTRAK

Ruang dalaman yang kreatif mempertimbangkan persekitaran fizikal, emosi peribadi, dan konteks budaya. Kesan emosi dan budaya yang terpadu dalam ruang dalaman belum dikaji secukupnya dalam kajian terdahulu. Oleh itu, kajian ini bertujuan untuk membangunkan Kerangka Reka Bentuk Emosi-Budaya ataupun dikenali sebagai ‘Emotional-Cultural Design Framework’ (ECDF) bagi merancang ruang dalaman yang dapat memenuhi emosi keperluan dan mengekalkan ciri-ciri budaya. Dengan mengintegrasikan teori reka bentuk emosi dan model reka bentuk budaya, kajian ini dimulakan dengan meneroka tahap reka bentuk emosi dalam ruang dalaman melalui kaedah temu bual secara berjalan dengan pengguna. Kedua, kajian ini mengumpulkan data melalui temu bual separa berstruktur dengan perekabentuk dalaman untuk mengenal pasti ciri-ciri budaya yang tertanam dalam amalan ruang dalaman semasa berkaitan dengan tahap reka bentuk emosi. Ketiga, perbincangan kumpulan fokus dijalankan dengan pakar. Analisis tematik digunakan untuk menganalisis data yang dikumpulkan dari lima belas pengguna, lima perekabentuk dalaman, dan enam pakar. Penemuan daripada lima belas pengguna menunjukkan bahawa terdapat tiga tahap reka bentuk emosi - estetika visual, kegunaan berfungsi, dan kehidupan individu - yang jelas dalam pengalaman pengguna di dalam bilik pameran yang menampilkan Gaya Hiasan Cina Baharu ataupun dikenali sebagai ‘New Chinese Decorative Style’ (NCDS). Penemuan daripada lima perekabentuk dalaman

menunjukkan bahawa empat tema berkaitan dengan ciri budaya dari pendekatan reka bentuk dalaman kontemporari yang digunakan dalam teknik dan amalan reka bentuk dalaman Cina. Hasil menunjukkan bahawa ECDF adalah penting untuk pembangunan ruang dalaman yang kreatif, dengan mempertimbangkan tahap visual termasuk susunan dan urutan, pematuhan warna, kebaruan, serta kekayaan reka bentuk. Sementara itu, tiga tahap fungsi utama adalah kegunaan, keselesaan, dan privasi. Aspek budaya, penyesuaian peribadi, dan elemen fesyen membentuk peringkat individu. Oleh itu, kajian ini berpotensi dalam mempromosikan pembangunan ruang dalaman yang kreatif dengan menumpukan secara komprehensif kepada tahap visual, fungsi, dan individu dalam reka bentuk dalaman dalam konteks NCDS.

**DEVELOPMENT OF EMOTIONAL-CULTURAL DESIGN
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ABSTRACT

A creative interior space takes into consideration the physical surroundings, personal emotions, and cultural context. The combined emotional and cultural effects of interior spaces have not been examined adequately in previous studies. Therefore, this research aims to develop an Emotional-Cultural Design Framework (ECDF) for designing interior spaces that can satisfy the emotional needs and retention of cultural characteristics. By integrating the emotional design theory and cultural design model, the study first explored the emotional design levels in current interior spaces using walking interviews with end-users. Secondly, in order to identify the cultural characteristics that embedded in current interior spaces practices in relation to the emotional design levels, this study collected data through semi-structured interviews with interior designers. Thirdly, a focus group discussion was conducted with experts. Thematic analysis was used to analyse collected data from fifteen end-users, five interior designers, and six experts. The findings, derived from fifteen end-users, indicate that three levels of emotional design - visual aesthetic, functional use, and individual life - are evident in the experience of end-users within showrooms featuring the New Chinese Decorative Style (NCDS). Next, the findings from five interior designers showed that the four themes related to the cultural characteristics of the contemporary interior design approaches employed in the Chinese interior design technique and practices. The results have shown that the ECDF is crucial for the development of creative interior spaces, considering the visual aesthetic level of

novelty, colour conformity, order and sequence, and richness of design. While the three main functional levels are usability, comfort, and privacy. The aspects of culture, personalisation, and fashion elements compose the individual level. Therefore, this study can be effective in promoting the development of creative interior spaces with a comprehensive focus on the visual, functional, and individual levels of interior design in the context of the NCDS.

CHAPTER 1

INTRODUCTION

This introductory chapter provides a thorough description of the research background in terms of the public's preferences for a more sophisticated lifestyle when it comes to interior design. It also explains the significance of fulfilling end-users' emotional needs while designing interior spaces. This chapter also explains the problem and gaps addressed in the investigation, which was guided by the pre-determined research objectives and questions. Apart from providing insight into the study's main aims, the chapter justifies the study's scope and significance before providing an overview of the thesis structure.

1.1 Background of Research

Interior design is a complex discipline that exerts a significant influence on human emotions and psychological well-being (Naser & Al-Mamoori, 2023). As the environments in which individuals reside have a profound impact on their mood, behaviour, and overall quality of life (Chang et al., 2020), interior designers should incorporate design elements to create environments that not only appeal aesthetically but also nurture the human psyche. According to Enwin et al. (2023), one of the elements that play a critical role in shaping the emotional atmosphere in living spaces is colours, where warm tones elicit energising effects and cool tones promote calmness. Other factors that also influence not only the living space's surroundings but also the residents' moods are lighting and spatial arrangements. Mesa-Pedrazas et al. (2023) explained that these factors, in the context of interior design, can also be a personal reflection of the residents' beliefs and values. Interior design is no longer limited to enhancing buildings or spaces' interiors to be more aesthetically pleasing, as the

designers now should not only meet functional requirements but also create designs that resonate with human emotions.

With the standard of living rising in China due to economic expansion, people have begun to prefer sophistication when it comes to interior design. Thompson and Johansen (2007) stated that societal growth and intricate architecture, resulting from the development of industrial processes, are both factors that have contributed to the profession of interior design. According to Maslow's proposed hierarchy of human needs, social and economic development can inevitably lead to the growth of people for material and spiritual needs (Lester, 2013). In response to the high need for interior design that may raise end-users' quality of living, the contemporary interior design business has evolved. In this present time, interior designers need to understand these end-user's needs and then adapt as well as diversify interior design accordingly. Sustainable interior spaces can only be designed if the interior designers are more focused on the unique needs of every end-user (Shen, 2021).

Maslow's hierarchy of needs is classified as physiological needs in the first stage, safety needs in the second, followed by needs for belongingness and love, esteem in the fourth, and the highest self-actualisation needs as shown in Figure 1. 1 (McLeod, 2018; Poston, 2009). Therefore, those who are more materially wealthy tend to be less content with simple shelter and want to higher-quality interior space that meets both their physical and spiritual needs (Thompson & Johansen, 2007).

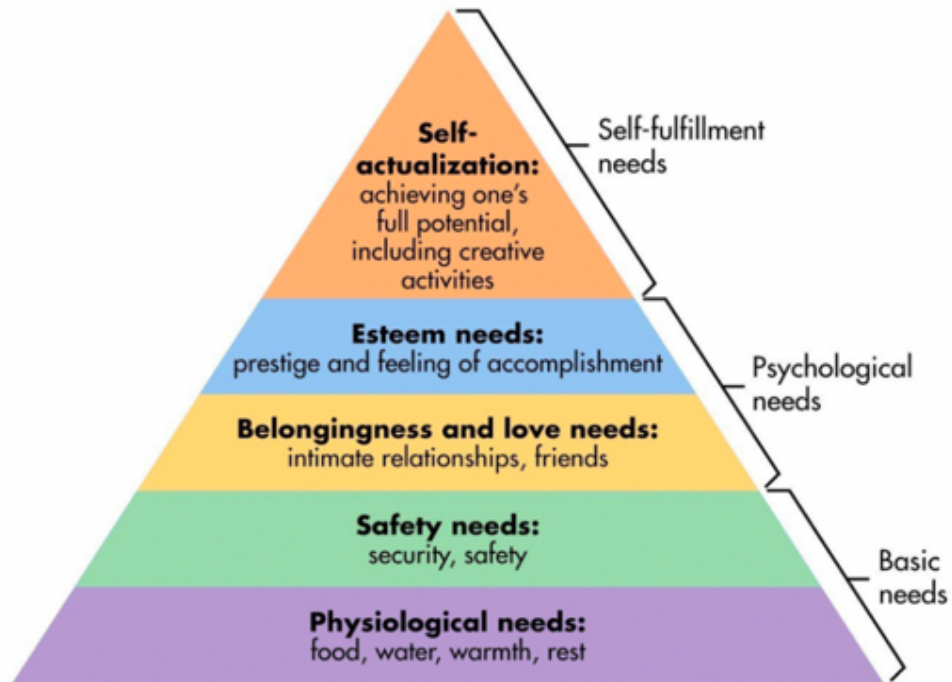


Figure 1.1 Maslow's hierarchy of needs

Source: McLeod (2018); Poston (2009)

These five needs are ranged from low to high to visualise individual tendency of prioritising the satisfaction of physiological needs (Maslow, 1943). When the needs at the lower level are better satisfied, a person will try to satisfy the needs at a higher level (Evans & Waggener, 2015). Within a certain period, a person may have multiple needs at the same time because multiple needs govern human behaviour; however, there is always one need that dominates (McLeod, 2018). In circumstances where only the lower-level needs are better satisfied well, the higher-level needs can become the driving force of human behaviour (Rouse, 2004; Sánchez et al., 2020). The self-actualisation needs are the most difficult of the five needs to satisfy (Taormina & Gao, 2013). The way to satisfy higher-level needs that a person is harder than the way to satisfy lower-level needs (Lester, 2013; McLeod, 2018). The hierarchy of needs presented by Maslow discusses the five different levels of individual needs, as shown in Table 1.1:

Table 1.1 Maslow's hierarchy of needs

Term	Definition	Source
Physiological needs	At the first level is the physiological needs of humans, such as food, water, warmth, rest, etc. Only by satisfying these basic needs that are essential for survival can one focus on the higher needs in the hierarchy.	(Evans & Waggener, 2015; Lester, 2013; Maslow & Lewis, 1987; McLeod, 2018; Sánchez et al., 2020)
Safety needs	Humans tend to look for a safe environment after the fulfilment of their basic physiological needs. Safe environments are essential to all humans as they prefer to live in a safe and familiar environment so that they can focus on further needs.	
Belonging and Love needs	The need to feel loved and accepted by the ones around them is essential as it allows humans to form relationships in their lives.	
Esteem needs	Esteem needs are linked to the desire to feel good. They are composed of two parts: the first one is self-confidence and feeling good, and the second is feeling the same level of respect and value from others. These needs are linked to achievement and recognition.	
Self-actualisation needs	Fulfilment in life is rare and is the highest need in the hierarchy. Self-actualisation is unique and different for everyone. It is something that makes them feel that they are living up to their potential and are doing what they are meant to do in their lives.	

In the context of interior design, end-users have various needs for the space. The low-level needs warrant the end-users' desire to not only be in a clean space but also protected from the wind and rain, hence meeting their psychological and security needs (Lambert, 2020; Sami et al., 2020; Shen, 2021). In short, the principle of the hierarchy of needs indicates that the higher-level needs should be fulfilled before reaching out to the lower ones (Evans & Waggener, 2015; McLeod, 2018; Sánchez et al., 2020). Addressing these desires by focusing solely on the basic needs of the interior space and the preservation of psychological needs while ignoring the end-user's self-actualisation needs is unsustainable (Sami et al., 2020; Thompson & Johansen, 2007). Therefore, interior designers need to adapt and diversify interior design according to every need of end-users.

With the focus on Maslow's hierarchy of needs in interior design research, some researchers are increasing their attention toward better adaptation of interior space to the design-oriented hierarchy of needs with functionality, reliability, usability,

proficiency, and creativity as shown in Figure 1. 2 (Grigoriou, 2019; Ivanović et al., 2017).

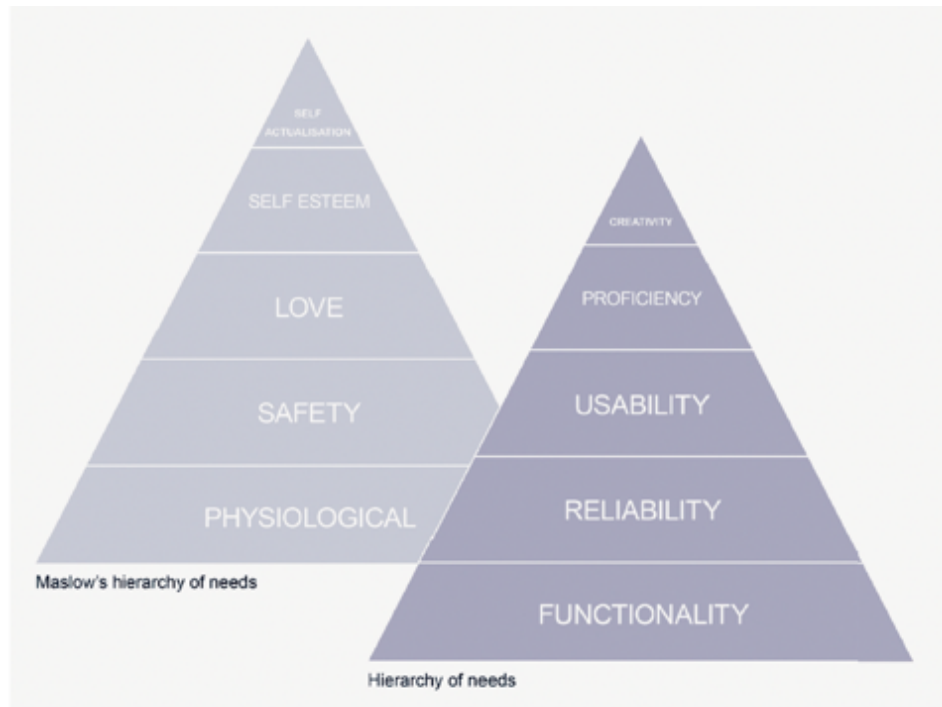


Figure 1. 2 Maslow's hierarchy of needs and design-oriented hierarchy of needs

Source: Grigoriou (2019); Ivanović et al. (2017);

Figure 1. 2 indicates an emphasis on functionality at the basic level, and the focus on creativity only comes in at a later stage of a good design (Clemons & Eckman, 2011). A good interior design inspires joy and calms the spirit of end-users. It can arouse courage, sympathy, pride, originality, security, and vigour (Kim & Lee, 2020). Creating a meaningful space that fulfils the needs of the end-users and maximises their space is one of our primary jobs as interior designers and is crucial to our society (Kim & Ha, 2020; Thompson & Johansen, 2007). Some researchers have utilised the different stages of Maslow's hierarchy of needs theory to explain the design-oriented hierarchy of needs (Evans & Waggener, 2015; Thompson & Johansen, 2007). The five needs are outlined and discussed briefly in Table 1.2.

Table 1.2 Design-oriented hierarchy of needs

Term	Definition	Source
Functionality	Functionality is the first stage of any good design because if the basic function of the design is not being fulfilled, then it can never be successful.	(Grigoriou, 2019;
Reliability	After the basic functionality needs are fulfilled, the next stage is the reliability of the design. A design needs to be stable and consistent throughout the process. If the functionality is sometimes fulfilled but fails at others, then the overall design is unsatisfactory.	Ivanović et al., 2017)
Usability	Usability means ease of use and flexibility in case of erroneous use. Usability also means that functionality and reliability can be achieved even after an error of use occurs, i.e., there is a chance of recovery in the design.	
Proficiency	Proficiency means that the design allows for improvement of the workflow throughout the usage lifecycle. Such a design provides the end-users with empowerment and control as it allows for adjustments.	
Creativity	Once all the above needs are met, the design reaches a creative need stage. The design can take an innovative form at this stage and allow the end-users to experience the product in ways that were not intended to be used initially.	

Interior design has the double attribute of substance and spirit (Brabuu, 2023). At first, the interior designers' main objective is to adapt interior space effectively to the end-users' basic needs, but as demands diversify, they are considering how to better adapt interior space to the emotional needs of end-users (Abdullah, 2018). To ensure that the design process strictly adheres to each end-user, some researchers suggest that interior designers must focus on the emotional needs of end-users (Cortés-Robles et al., 2019; Feng et al., 2022; Ngoc & Fassi, 2018). Interior design gradually began to pay attention to people's emotional experience in interior space activities on the premise of functionality (Mei, 2022).

The idea of emotional design in interior space impacts how interior spaces affect people physiologically and psychologically as well as how they engage with it visually, functionally, and emotionally (Cosentino, 2023; Imm-cologne, 2023). Maslow's hierarchy of needs also has important guiding significance in the theoretical system of emotional design (Norman, 2003). Norman's (2003) book "Emotional Design" explains the three emotional levels and how an individual's different perceptions

trigger these emotional levels. These parts are called Norman's three levels of emotional design (Dybvik, 2022; Norman, 2003). Each level plays a different role in influencing an individual's perception of the world. These emotional levels are visceral, behavioural, and reflective as shown in Figure 1. 3 (Kamil & Abidin, 2013). These levels are basic dimensions of emotions, and each dimension determines how people emotionally connect to different individual's experiences. Norman's emotional design theory allows researchers to examine interior design from the perspective of the emotional interactions that people have with their surroundings.

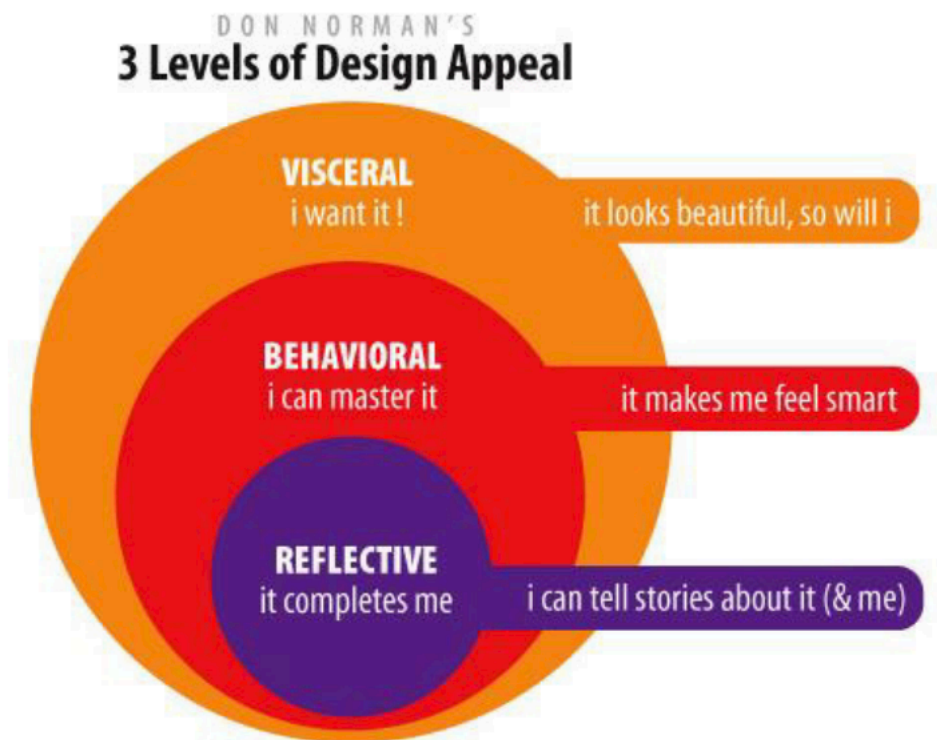


Figure 1. 3 Three levels of Don Norman's emotional design

Source: Kamil & Abidin (2013)

Interior spaces have a dominant role in changing the emotional levels of end-users when they are active in the spatial environment. The way in which the interior space is constructed corresponds to the daily behavioural habits and psychological activities of end-users. This approach is an external manifestation of the inner nature of the end-

users moving in the interior space. It is inseparable from their daily life experiences and ideologies. The atmosphere created by the interior space that meets the emotional needs of the end-users is important in the spatial environment.

With the continuous society development, interior design has become more diverse. Interior space designs with strong stimulation to the human senses have also begun to appear in large numbers. The sustainability of the emotional atmosphere it creates and the emotional needs of the experience with the degree of fit are important to consider in the interior design process on the premise of meeting aesthetic and functional needs (Mei, 2022). The design process is initiated strictly in accordance with end-users' expectations and focuses on their unique emotional experience as interior designers in designing the interior space.

Moreover, the design of interior space is inextricably linked to many factors, such as current trends, social situations, technological development, and local culture. There are concerns about how a designer can provide answers that meet the demands of end-users while also managing to maintain cultural characteristics (Kane, 2016; Thompson & Johansen, 2007; Vaux & Wang, 2016; Vaux & Wang, 2020). The era of Chinese cultural self-confidence has come to provide consolation for Chinese interior design. China is a country that is unique in terms of its art and design history as it is influenced by years and years of historical events in the region. The core of Chinese culture has grown and spread into modern life with the growth of economic globalisation and the rising popularity of new classicism. Therefore, it is vital to study the decorative design of Chinese interior spaces.

General Secretary of the China Xi Jinping stressed the importance of a nation's culture during his report to the 19th National Congress, emphasising its importance to the nation' success and power. He reiterated further that a nation's culture must flourish

for that nation to prosper, and the great rejuvenation of the Chinese nation cannot happen without a strong cultural identity and vibrant culture. The foundation of Chinese culture, Chinese traditional culture, is something to be admired and preserved (Qin, 2019). To do this, he developed the cultural power strategy which fosters creative innovation and the transformation of the Chinese traditional culture in order to place a strong emphasis on upholding traditional Chinese values as contemporary interior design and classical architecture share multidisciplinary connections both in theory and practice (Yang, 2015). It is crucial to continually investigate the classical architecture, and cultural characteristics within interior spaces to advance the interior design business and fuse contemporary interior design practice with Chinese classical cultural value.

1.2 Problem Statement

People's emotions in the modern world are closely connected to their surrounding environment. Generally, from the perspective of interior design, their focus is more on the interior designs of places where they spend most time, such as homes, workplaces, shopping malls, restaurants, hotels, etc. Nevertheless, there are circumstances where the interior designers' visions and the end-users' needs are not in line, as interior designers are more inclined to neglect end-users' emotional needs in interior design (Wang & Hsiao, 2018) as they prioritise meeting the end-users' physiological, safety, and aesthetic needs and overlook the significance of self-actualisation values.

It is also important to highlight that using interior spaces and methods for preserving artistic designs is an unsustainable practice when these designs do not consider the end-users' emotional needs (Jang & Ha, 2015; Reddy et al., 2012; Yang & Wang, 2019). Moreover, interior design workers will also face challenges in obtaining good

assessments from the end-users if interior designers overlook the end-users' emotional needs. Therefore, interior designers should have detailed information and knowledge regarding the emotional needs and priorities of the end-users before creating any interior space to preserved artistic designs.

Nevertheless, the problems surrounding interior design are not limited to the designers' inability to include the end-users' emotions when planning their layouts but also the difficulties in incorporating traditional Chinese decorative styles. Traditional Chinese design aesthetics are found to be incompatible with contemporary materials and the technological requirements in the current interior design domain, which is a significant reason for the potential loss of interest in traditional Chinese design (Ding & Guo, 2019; Jain, 2022).

Additionally, inspirational and artistic design are different elements that cannot be described based on the same concepts. It is required that cultural aspects related to the various design elements transform by keeping the creative dimensions in mind with the help of both national and regional cultural resources (Wang, 2020; Yang et al., 2022; Zare et al., 2020). The cultural design should integrate the people's emotions, wisdom, and inspirational values along with modern concepts related to technology, science, and industrialisation (Urmonalievich, 2021; Yu & Liang, 2021). The expressions and thinking modes related to modern designs and cultural designs should be used so that the new form of cultural content can conform to the life of people in today's world (Hou, 2020; Wang, 2020). However, the traditional Chinese design style has become incapable of meeting the requirements of contemporary and spatial design of interior spaces. All the processes, such as manufacturing, use of raw materials, and the high cost and functionality of furniture, are no more according to the modern-day requirements of end-users (Huang & Shi, 2021; Li, 2019).

Furthermore, Chinese interior design has a heavy influence on the interior design trends from the foreign interior design strategies used in America and Europe. These heavily influential esthetical designs from foreign domains have resulted in a lack of interest in Chinese traditional design strategies. Therefore, it is crucial to develop a comprehensive understanding of the needs and different levels of emotional designs among Chinese end-users to fill the gaps and connotations (Zhang & Xu, 2021).

Despite researcher's focus on interior design, it remains a misunderstood and fractured discipline; hence is in requirement of more detailed research. The essential aspects associated with residential interior space that contribute to meeting the emotional needs of the end-users have rarely been identified in previous research. In the emotional design aspect, the focus on emotional design is limited to specific aspects (Ho & Siu, 2012; Zhou et al., 2020). Scholars who study emotional design can be broadly categorised into three major research groups: management, engineering, as well as art and design. Engineering focuses on analysing consumer's emotional responses from modelling and selecting the best design solution from it; management generally starts from the pre-assumption, verifies the assumptions, or revises them through empirical data, and focuses on improving the design efficiency from the management point of view; as well as art and design explore the law of emotional design more from the perspective of thinking and discernment (Shen, 2020). Research has been conducted recently to see how emotions play an important role in interior design. Many researchers worked on different factors and dimensions to identify those crucial aspects related to interior design that significantly contribute to fulfilling the end-users' emotional needs. Emotional design has been found to enhance the psychological aspect of the end-users which increases their preference for innovative design. Although previous authors illustrated clear emotional design processes, most

of the research focuses on public interior design, with little focus on residential interior design. The summary of studies incorporating interior design or emotional design is summarised in the following Table 1.3:

Table 1.3 Literature search of interior design or emotional design

No	Authors	Year	Country	Product/ space	Description
1	Madani Nejad,	2007	Texas	Interior design	The authors believe that using curvilinear forms is beneficial to the body, mind, and spirit (Madani & Nejad, 2007).
2	Grace Lau K.	2008	Hong Kong	Hotel interior design	The author conducts research from three aspects: objects in hotel rooms, end-users' behaviour, and end-users' emotional experience. It is proposed how to realise the emotional value of the indoor environment through the design of the hotel interior environment and how to create an environment that causes the end-users to have the corresponding emotional experience (Grace, 2008).
3	Lo, Kathy. Pui. Ying.	2010	Hong Kong	Hotel interior design	The emotional design emphasises the relational aspects of design, sustainability and emotions, transformational experiences, tools and methods, and hotel stay customisation (Lo, 2010).
4	McCartan, Moody & McDonagh	2011	USA	Superyacht interior design	The presented design output demonstrates a significant engagement with emotional design, which enabled luxury to be visually elucidated in a cultural context as a tool to inform the interior design process for a specific person (McCartan et al., 2011).
5	Uluçay,	2019	Turkey	Interior colour scheme	Students who take the survey have meaningful relationships on spatial colour preferences, and differences are determined by emotional states (Uluçay, 2019).
6	Zhou, Jiahui	2019	China	Interior design furniture	People-oriented design and emotional-oriented experience design have gained popularity (Zhou, 2019).
7	Kim & Ha	2020	Korea	Interior design	Interior design that promotes physiological comfort and emotional satisfaction can aid in the improvement of mental health and well-being (Kim & Ha, 2020).
8	Mei Heqing	2022	China	Indoor public space	This paper is based on the theory of "emotional design" proposed by American behavioural psychologist Donald A. Norman. It is applied to the design of indoor public space to discuss the relationship between human emotion and indoor public space design (Mei, 2022).
9	Maiocchi & Shafieyoun	2022	Italy	Healthcare environment interior design	Relationships between emotions and the patient's reactions to disease and therapies (Maiocchi & Shafieyoun, 2022).

Besides, the residential interior space cultural characteristics of the NCDS have not been systematically investigated. In the related cultural design aspect, the classification of cultural features is important as it guides interior designers in the early stages of the design process. It can help them make informed decisions by examining the previous use of cultural features. The NCDS design had captured much attention in architectural design, especially in landscape design, but was limited to residential decorative design. The summary of studies incorporating interior design and cultural design, or NCDS is summarised in the following Table 1.4:

Table 1.4 Literature search of interior design and cultural design or NCDS

No	Authors	Year	Country	Product/ space	Description
1	Gang	2018	China	Garden landscape	Utilising bamboo in a NCDS design highlights three contemporary construction techniques: blending of textures, a continuation of the landscape, and softening of the landscape (Gang, 2018).
2	Li et al	2019	China	Build environment landscape	A NCDS landscape space cognitive model has been successfully developed, and operator optimisation heredity grade is used to identify the genetic algorithm's structure and adjacent matrix to obtain the landscape cognition accurately. Following this, the NCDS landscape space design is given direction (Li et al., 2019).
3	You & Mai	2019	China	Garden Landscape	The NCDS architecture can compete with the Chinese traditional landscape that is closely related to nature and reflects the ideological pursuit of Taoist traditional culture. As a result, the NCDS design can maintain the traditional design (You & Mai, 2019).
4	Wang	2020	China	Architecture space	The market recognised the NCDS architecture leading space, which generally refers to the residential area's prospect square, gate, sales office, and supporting landscape (Wang, 2020).
5	Li et al	2021	China	Commercial streets	The effectiveness of the landscape is improved by the NCDS design (Li et al., 2021).

Additionally, the research on how to design a creative interior space with emotional design levels while risking cultural characteristics has not been explored in greater

detail. However, the concepts of emotional designs and cultural designs have only been studied in combination regarding the development of some aspects, including the field of calligraphy (Mohamed & Youssef, 2014), wearable products (Hou, 2020), and road signs (Xiao et al., 2022). Therefore, there is a limited number of directly related studies that have been published in previous research on interior design focusing both on emotional and cultural design.

As discussed in the study (Feng et al. 2022), changes in Chinese culture and trends over time require a change in the way of interior design. However, no study has assessed the combined effect of emotional design and the NCDS design, particularly for the residential interior space. Some summaries of studies incorporating emotional design and cultural design are summarised in the following Table 1.5:

Table 1.5 Literature search of emotional design and cultural design

No	Authors	Year	Country	Product/ space	Description
1	Mohamed & Youssef	2014	Egypt	Packaging Designs	The Arabic alphabet reflects history, culture, and identity. Various styles and types offer great flexibility in different packaging design elements and even structural designs. Software and modern digital systems help to transfer Arabic calligraphy from paper to computer monitors and then apply these digital graphic designs to packaging (Mohamed & Youssef, 2014).
2	Dejean et al	2020	NA	Industrial design	To convey a “positive emotion” to the consumer, the field of product design, which is closely related to marketing, business, communication, and advertisement, pays close attention to emotion (Dejean et al., 2020).
3	Hou	2020	China	Creative product	To aid consumers in creating a sense of design identity and cultural identity for cultural and creative products and putting cultural confidence into practice, emotional design criteria for cultural and creative products with a focus on end-user experience were established (Hou, 2020).
4	Guo et al	2021	China	Post-industrial landscape	Human-Centred Emotional Design and cultural strategy as tools for an urban renovation that can draw in funding, establish the city as a distinctive brand and promote interaction and sensual

					engagement among end-users (Guo et al., 2021).
5	Xiao et al	2022	China	Road signs	Ceramic road signs with blue letters on a white background were used as extracted elements to design and explore cultural and creative products. It explored how to transform Macao's culture into cultural and creative products and whether the cultural and creative products produced can enhance consumers' purchase intention and cultural identity (Xiao et al., 2022).

Based on the literature review related to interior design, emotional design, and cultural design, the following research gaps have been identified and shown in Table 1.6. The core problem is the combined emotional and cultural effects of interior spaces have not been examined adequately in previous studies. To date, no research has explored the combined effect of emotional design and cultural design particularly for residential interior space.

Table 1.6 Research gaps

Topic	Keywords	Source	Finding	Research Gap
Overview of interior design and emotional design	“Interior design” or “Emotional Design”	(Bae et al., 2019; Hall & Tewdwr-Jones, 2019; Milne & Herff, 2020; Sun et al., 2011; Triatmaja, 2020; Yanksari, 2020) etc.	A minimal number of articles that utilise a theoretical framework. Among the 355 articles, only 29 (8.7%) are developed from theoretical frameworks (Bae et al., 2019). Although previous authors illustrated clear emotional design processes, most of the research focuses on product design and little focus on interior design.	Research Gap 1 (RG 1): The essential aspects associated with residential interior space which contribute to meeting the emotional needs of the end-users have rarely been identified in previous research.
	“Interior design” and “Emotional Design”	(Kim & Ha, 2020; Madani & Nejad, 2007; McCartan et al., 2011; Maiocchi & Shafieyoun, 2022; Uluçay, 2019; Zhou, 2019) etc.	There are a limited number of directly related research that have been published in residential interior space focusing on emotional design in previous research.	
Overview of interior design and cultural design	“Interior design” and “Cultural Design” or “New Chinese	(Chandel et al., 2016; Gang, 2018; Ivashko et al., 2020; Li et al., 2019; Othman et al.,	NCDS design has captured much attention in architectural design especially in landscape design but is limited to residential interior design.	Research Gap 2 (RG 2): The residential interior space characteristics of the NCDS

	Decorative Style”	2015; Silva, 2019; You & Mai, 2019) etc.		have not been systematically investigated.
Overview of emotional design and cultural design	“Emotional Design” and “Cultural Design” or “New Chinese Decorative Style”	(Dejean et al., 2020; Guo et al., 2021; Hou, 2020; Mohamed & Youssef, 2014; Xiao et al., 2022) etc.	The combined emotional and cultural design was conducted for some product developments such as calligraphy, wearable products, and road signs, not found in residential interior design.	Research Gap 3 (RG 3): To date, no research has explored the combined effect of emotional design and the NCDS design particularly for residential interior space.

An effective interior space takes into consideration all the intellectual, tangible, and external variables and balances them to create an interior space that looks aesthetically, functionally, and emotionally. In addition, culture has an impact on individual mentality. It is also an integral leading force in the design of interior spaces. Individuals and their culture are influenced by their natural surroundings and inversely. Individuals, traditions, and the natural setting can be understood separately; rather, all three must be taken into consideration together. Thus, there is a substantial connection between physical surroundings, personal emotions, and their cultural context. It is a difficult task to balance all of these factors, yet doing so produces the ideal interior space layout (Reddy et al., 2012).

1.3 Research Questions

According to the above discussion, the following are the research questions of this study:

- i. What are the emotional design levels of current interior spaces?
- ii. What are the cultural design characteristics embedded within current interior spaces in relation to the emotional design levels?
- iii. How can interior designers create interior spaces that can meet the emotional design levels while enhancing cultural characteristics?

1.4 Aim and Objectives

A clear aim can help the researcher to focus on the right direction and achieve the objectives of the research study (Parija & Shrivastava, 2023). This thesis is aimed at filling the gap that exists in the literature by conducting a study on interior space design, focusing particularly on the NCDS since the combined emotional and cultural effects were not given much attention before. The following are the research objectives of this study:

- i. To explore the emotional design levels of current interior spaces.
- ii. To identify the cultural design characteristics embedded within current interior spaces in relation to the emotional design levels.
- iii. To develop an ECDF for designing interior spaces that can satisfy the emotional design levels and retention of cultural characteristics.

1.5 Scope of the Study

With the enhancement of the comprehensive national power and economy in China, there is increased improvement in terms of the living environment and interior spaces. In today's world, people are more inclined towards customisation. As human needs change over time, customisation is preferred by most of the end-users, whether it is in the form of a customised clothing, food, car, or interior space. Nevertheless, although different studies discussed the interior design, most of these studies did not relate the field of residential interior spaces to emotional design. Therefore, it is required that the impact of emotional design is studied in the residential interior spaces so that the experience of end-users can be enhanced.

In addition, there is an increased focus on research in China on the NCDS. It can help cultivate and associate emotions with preserving Chinese culture and meeting the

preferences of various end-users. The traditional Chinese style, in terms of procurement or handcrafting of raw materials, functionality designing, etc., has been unable to meet the requirements of contemporary interior design. There is a need to emphasise back on the NCDS of design in which the new technology is being incorporated into the already existing cultural aspects in China. It has helped Chinese designers re-establish their originality and uniqueness in the design of modern luxury decorative styles, as well as gaining a foothold in the local market and establishing its reputation in the international market. However, there is a lack of English articles in this domain that can help spread the Chinese culture to other countries. Hence, there is an increased need for English research on this topic.

Considering these research gaps and the background, interior design principles and strategies that are based on emotional design theory, cultural influence, and NCDS perspectives are in line with the artistic aesthetics and living needs in contemporary perspectives. It also helps indirectly provide a developmental path for cultural design and emotional designs for establishing a variety of patterns in the field of interior design. The current research study was conducted by investigating China's cultural characteristics related to the NCDS, as well as the emotional designs emphasised in this study so that the aspect of creative transformation can be integrated within the residential interior spaces.

1.5.1 Residential Interior Space

In terms of the research background, this research focuses on the need for emotional design and cultural design to be implemented for creative residential interior spaces. The focus of the proposed study is to understand how emotional levels and cultural factors impact interior design processes, principles, and strategies. People's emotions are guided by the interactions that they have with their surroundings. They want to

make their positive experience by associating positive emotions with those places (Li, 2020). Therefore, interior designers should put extra effort into the beautification of the places that people spend most time with such as houses, offices, schools, etc. Interior design is applied to two kinds of structures, namely, public buildings and private buildings (Ni & Li, 2010; Wang & Hsiao, 2018). The current study emphasises the residential interior design of private buildings.

Residential designs play a crucial role in people's lives as various daily activities are performed within those spaces. The designing of residential interior space is much simpler than commercial interior projects, as the space is much smaller, and the requirements are lesser. However, it should be modified in accordance with the requirements and lifestyle of end-users. In actuality, the most beautiful houses are typically ones that have been improvised and created by creative homeowners. As opposed to other types of interior spaces, residential interiors are more liberated and intimate for both interior designers and end-users (Nabil & Kirk, 2019). Residential interior designers and end-users should consider the seven principles of interior design to create the perfect balance, contrast, emphasis, rhythm, and proportions (Milne & Herff, 2020). Moreover, cultural as well as social considerations must be kept in mind while designing residential spaces (Muhammad & Mahmoud, 2018).

1.5.2 New Chinese Decorative Style (NCDS)

This research focuses on the emotional design in the Chinese cultural background for residential interior spaces. As the current study conducted in China, the cultural characteristics emphasised the New Chinese Decorative Style (NCDS) in relation to emotional design as a creative transformation for interior design (Zhang & Xu, 2021). An emotional design approach tried incorporating the NCDS design for residential interior space to preserve the cultural Chinese design. The reformation of the Chinese

traditional culture has led to the embodiment of Chinese traditional cultural elements into NCDS (Dong et al., 2013; Xiang, 2022).

The traditional decorative elements of the traditional Chinese design have found new meaning in the NCDS strategies (see Figure 1. 5). NCDS can be defined as a combination of the modern technique in their design domain and additional elements of design strategies in China by understanding the traditional culture and refining it to meet the requirements of the contemporary world (Xiang, 2022). In time, NCDS has developed the Chinese economy by integrating foreign cultures to improve the aesthetic quality of Chinese design strategies without disregarding traditional values. Such a merger of traditional and modern strategies leads to the creation of unique and charming aesthetics that can tend to the artistic as well as functional needs of end-users. Most importantly, these designs ensure that historic architectural culture is authentically preserved and advanced within contemporary interior design (Yang, 2015).

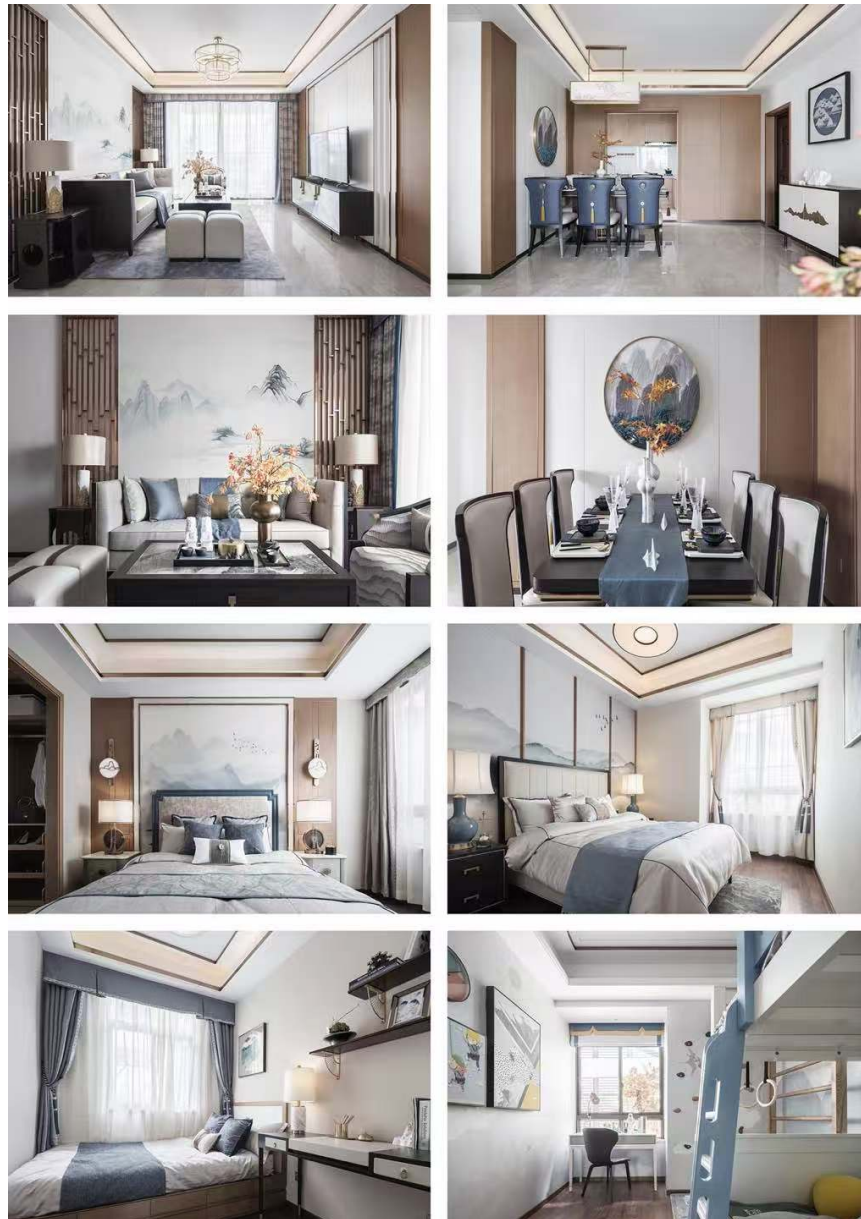


Figure 1.4 NCDS residential interior space

Source: Author

China has left the period of adoring Western culture and cutting-edge technology due to its tremendous economic growth (Huang, 2008). The current Chinese style, also known as the NCDS, is based on maintaining the cultural significance of Chinese classical style while incorporating cutting-edge technology and modern decorative techniques to enhance the decorative style's appeal. More western concepts have been incorporated into the NCDS and are used in interior design at various places such as hotels, bars, clubs, market, shops, homes, and workplaces (Wang, 2021). There is an

increased focus on research in China on the NCDS. Qin Wu-Guo, director of the Tsinghua University Department of Architecture, commented that:

“The degree of westernization of design is correlated with economic progress. It will start to return to nationalisation up until a certain extreme. This pole should now start to appear”.

The NCDS is a decorative style that revives traditional culture and looks into regional characteristics. These are two recurring themes in modern Chinese design. The NCDS is calm and close to nature, combining Chinese and Western features, old and new alternate ways, various selected typical elements, and traditional and modern decorative means to demonstrate the beauty of nature. As it combines traditional culture, local custom, and contemporary trends, the NCDS path is becoming more obvious. Among the latest cultural designs, the NCDS is becoming more and more popular even in Western design. There is a need to emphasise back on the NCDS design which incorporates new technology into the existing culture is expected may cultivate emotion toward cultural preservation yet meet their preference (Zhang & Xu, 2021).

1.6 Significance of the Study

This study is the first of its kind to investigate the emotional responses and cultural characteristics of the NCDS interior design. The investigation is significant as apart from adding valuable research to the field of interior design for designers, scholars, and researchers and it is expected to contribute to the refinement and development of the theory of emotional design for interior space, increasing the designer's consciousness about the end-user's desires, and minimizing design errors prompted by the designer's misinterpretation of end-user's needs.

Furthermore, as the research considers emotional responses associated with cultural features in interior design practice, the findings are critical because they reconnect the

Chinese with their culture by encouraging them to live in interior spaces reflecting Chinese culture. It allows more people to appreciate the appeal of Chinese traditional culture properly and motives them to reclaim their cultural self-confidence by strengthening their emotional attachment. The findings from this study are expected to help maintain the culturally based interior design among the Chinese while considering their needs and emotions. In addition, there would be several contributions to conducting this research. These contributions are divided into two major domains namely practical and theoretical contributions.

From a practical perspective, in relation to RO1 and RQ2, the analysis of essential aspects associated with residential interior space that contributing to meeting end-users' emotional needs showed that different types of interior space designs have a significant impact on people's emotions. The findings also revealed that the combination of emotional and cultural designs, especially in NCDS's context, played a notable role in interior design as it can serve as a guide to help designers accurately grasp the design project style positioning and control the spaces' atmospheres by focusing on enhancing the end-users' spiritual living experiences in their designs.

Theoretically, in reference to RO2 and 3, this study discusses the related literature in the domains of interior design principles and processes, residential interior design, emotional design theory, and the NCDS design features and characteristics. In terms of RO2, the review provided deeper insight into interior design's theoretical system as it promoted the cross-fertilisation of multiple disciplines and provided a reference for subsequent interior design research. For RO3, while ECDF is determined as a major contribution to interior design research and theory, the discussion allowed the systematic accumulation of related recent and past literature, which provided a source of increased knowledge sources for future researchers and academicians.

In summary, the proposed study will be highly beneficial in the domain of interior design, emotional design, and culture design, especially focusing on residential interior design in the NCDS of China, as it has a positive impact on cultural tourism, cross-cultural interaction, and the international recognition of Chinese culture, hence allowing more Chinese to be culturally confident in accepting cultural-related interior designs as part of their lives.

Careful integration of such design creates an emotional connection with end-users and contributes to the expansion and preservation of cultural values. Therefore, although globalisation makes it simple to lose or weaken a place's cultural identity, the ECDF concept helps support cultural heritage by preserving and even promoting cultural features by adding cultural components to the interior space design.

1.7 Thesis Structure

This thesis has six chapters comprising an introduction, followed by a review of literature, methodology, resulting analysis, and the last chapter of discussion and conclusion. The major description of these chapters is presented below.

Chapter 1: Introduction

The introduction chapter introduces the background at first. Based on the problem statement and research gaps, this research also introduces the research questions and objectives of the study. The need for the study is also justified by providing its rationale, scope, and significance sections.

Chapter 2: Literature Review

The second chapter is the literature review. This chapter outlines an overview of emotional design and cultural design in interior design. The major domains are