

Article

Furniture Development Framework for Cultural Conservation: A Case Study of Peranakan Chinese in Singapore

Wenhong Huang ^{1,2} , Ahmad Rizal Abdul Rahman ^{2,*}, Sarjit S. Gill ³  and Raja Ahmad Azmeer Raja Ahmad Effendi ²

¹ School of Fine Arts and Design, Changsha Normal University, Changsha 410100, China; huangwenhong0@gmail.com

² Faculty of Design and Architecture, Universiti Putra Malaysia, Serdang 43400, Malaysia; azmeer@upm.edu.my

³ Faculty of Human Ecology, Universiti Putra Malaysia, Serdang 43400, Malaysia; sarjit@upm.edu.my

* Correspondence: rizalrahman17@gmail.com; Tel.: +60-135151159

Abstract: The Peranakan Chinese, formed through intermarriage between Chinese immigrants and Southeast Asian indigenous people, represent a unique example of cultural amalgamation. As modern society evolves, the conservation of their culture faces significant challenges, particularly in balancing heritage preservation with contemporary relevance. Addressing how Peranakan cultural products can meet the functional and emotional needs of modern audiences while achieving sustainable cultural development is a question worthy of in-depth exploration. This study uses the “SR” furniture series from Singapore’s “I” brand as a case study to examine how cultural products can integrate Peranakan heritage into modern life while promoting cultural conservation. Guided by affordance theory and thematic analysis, this research identifies four key strategies: (1) Cultural Integration and Expression; (2) Modern Innovation in Furniture Design; (3) Promotion and Sustainability; and (4) Social Engagement and Education. Based on these strategies, this study proposes a framework for cultural conservation in furniture development. This framework offers actionable strategies for designers, businesses, and policymakers to create products that meet both functional and emotional needs while fostering cultural conservation and adaptation in a globalized context.

Keywords: Peranakan Chinese; furniture; case study; cultural conservation; Singapore



Citation: Huang, W.; Rahman, A.R.A.; Gill, S.S.; Ahmad Effendi, R.A.A.R. Furniture Development Framework for Cultural Conservation: A Case Study of Peranakan Chinese in Singapore. *Sustainability* **2024**, *16*, 10818. <https://doi.org/10.3390/su162410818>

Academic Editor: Koichi Murata

Received: 5 October 2024

Revised: 5 December 2024

Accepted: 6 December 2024

Published: 10 December 2024



Copyright: © 2024 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

The Peranakan Chinese, formed through intermarriage between Chinese immigrants and indigenous Malays in the Malay Peninsula between the 15th and 17th centuries, represent a unique example of cultural amalgamation. Originating mainly from Malacca, the Peranakan Chinese in Singapore hold a significant place in the nation’s cultural heritage. Their culture, characterized by a harmonious fusion of traditional Chinese, Malay, and Western influences, exemplifies inclusivity and diversity, making it a symbol of Singaporean national identity [1–3]. However, this cultural richness has faced significant challenges, including population decline and socio-economic disruptions during the 19th and 20th centuries, which have affected its sustainability [4,5].

Globalization and modern lifestyles have further marginalized Peranakan culture, raising concerns about its “museumization”—a static preservation of cultural practices that diminishes their vitality [4,5]. Efforts such as media productions like *The Little Nyonya* have reignited public interest [6]. However, ensuring the long-term sustainability of this cultural heritage requires innovative strategies to integrate cultural traditions into contemporary life, making them relevant to modern audiences.

Furniture, as a medium closely tied to daily life, holds great potential for transmitting and preserving Peranakan Chinese culture. Modern furniture design not only reflects aesthetic and functional values, but also serves as a symbolic bridge between traditional

heritage and modern lifestyles. By incorporating culture and aligning with contemporary user needs, furniture can promote cultural conservation in a dynamic and engaging manner.

This study aims to explore the intersection of cultural conservation and furniture design, focusing on the following research question:

What furniture development strategies can support the conservation of Peranakan Chinese culture in Singapore?

2. Literature Review

The Peranakan Chinese culture has been a focal point for scholars due to its unique identity shaped by the integration of Chinese, Malay, and Western influences. While Western scholars, such as Montsion and Parasram (2018), describe Peranakan culture as a result of local assimilation influenced by colonial history and socio-economic conditions [6], Eastern scholars emphasize “acculturation” as a dynamic process of mutual adaptation, highlighting its manifestations in diverse cultural expressions [7–10] such as language [11], cuisine [12], apparel [13], and architecture [14]. Examples include the intricate aesthetics of Nyonya batik sarongs blending Javanese and Chinese influences [13], and the hybrid culinary heritage of Baba Nyonya cuisine, which integrates Chinese and Malay traditions, but struggles to engage younger generations [12]. Despite its richness, many researchers warn of the risks of “over-museumization”, where cultural practices are frozen as static artifacts, neglecting their evolution as living traditions [4,15].

In the realm of cultural heritage conservation, innovative strategies have emerged to address these challenges. Abdulqader (2016) focused on documenting traditional design processes for Baba Nyonya wooden embellishments, proposing a three-stage algorithm (micro, macro, theme) that integrates design principles such as symmetry and transformation to ensure balance and harmony in interior spaces [16]. Similarly, Darmayanti and Bahaud-din (2020) highlighted the role of Peranakan houses in Lasem as cultural identity markers amidst modernization pressures [17]. During the COVID-19 pandemic, Khuluqiyah and Delijar (2022) demonstrated how digital platforms helped preserve the Wayang Potehi puppetry, showcasing the adaptability of traditional practices during crises [18]. These studies collectively stress the need for a balance between preserving historical authenticity and fostering modern adaptability to ensure the survival of Peranakan culture as a living tradition.

In terms of theory, affordance theory was first proposed by James Gibson, focusing on the possibilities for action (affordances) provided by the environment to individuals [5]. Donald Norman expanded this concept by distinguishing between real affordances (physical attributes) and perceived affordances (user interpretations), emphasizing the importance of cultural constraints and conventions in design [19]. In cultural heritage protection, affordance theory emphasizes the role of interactive design in enhancing public participation and ensuring the functionality and cultural resonance of cultural products, providing an effective connection between traditional heritage and modern needs.

In recent years, Peranakan Chinese culture has inspired various modern product designs that aim to integrate traditional cultural elements into contemporary contexts. These products not only serve functional purposes, but also act as vehicles for cultural preservation and promotion. Recent studies have highlighted innovative approaches to incorporating Peranakan cultural motifs into modern designs, showcasing the potential of cultural products in bridging the past and present. For instance, Rakhim et al. (2020) designed a freestanding kitchen cart named “Dapoque”, which integrates traditional Peranakan motifs into a functional and aesthetic piece for modern kitchens [20]. This product demonstrates how cultural motifs can be adapted to meet contemporary needs while raising awareness of Peranakan heritage. Similarly, Yeoh et al. (2021) investigated the use of sustainable palm paper in Peranakan-inspired packaging, emphasizing the objective of cultural conservation [21]. These examples reflect the versatility of Peranakan culture in influencing diverse product categories, from furniture to packaging. However, existing research usually focuses on the preservation of Peranakan culture by simply visually

combining traditional graphics or cultural symbols with modern products, which have very limited effects on Peranakan Chinese cultural conservation, and lacks a systematic product development strategy aimed at Peranakan Chinese cultural conservation. Based on the successful furniture development case in Singapore, this study explores how to use a systematic development strategy to make Peranakan Chinese culture widely recognized through modern furniture, thereby ensuring the sustainability and modernity of this cultural heritage in the context of globalization.

3. Materials and Methods

This study follows the interpretivist research paradigm in qualitative research and adopts case study methodology to conduct a single case study, as it allows in-depth exploration of a project, event, activity, or process, offering comprehensive insights into the research questions posed [22,23].

3.1. Sample Selection

The samples in this study are drawn from the Peranakan Chinese furniture series “Straits Reflection” (SR) developed by Singapore’s “I” Furniture Company. The SR series, launched in 2018, comprises over ten types of furniture and furnishings, with more pieces being added. The company’s founder (PT2) conceptualized the series after visiting the Peranakan Museum in Singapore, with the aim of promoting and preserving this marginalized cultural heritage. The designers involved (PT1 and PT3) were senior industrial product designers experienced in human–computer interaction, but not specialized in furniture design. They brought deep understanding of Peranakan Chinese culture to the project.

With the collaboration of the Peranakan Museum and the Singapore Heritage Board, the team selected a culturally significant artifact—a bedspread—from the museum’s collection as inspiration (Figure 1). The design was then modernized to align with contemporary living habits while preserving cultural behaviors. All SR products are handmade, with craftsmen enhancing the decorative patterns based on the designers’ sketches (Figure 2).



Figure 1. The “SR” series is inspired by the bedspread from the collection of the Peranakan Museum in Singapore.

Following its launch, the series received widespread recognition from the government, market, and media (Figure 3), successfully promoting both cultural development and commercial success. The company is the only known entity currently focused on developing

modern Peranakan Chinese furniture with a cultural heritage agenda. Given the uniqueness and representativeness of the samples, purposive sampling was employed. This study defines the case as the development of a modern furniture series rooted in Peranakan Chinese culture in Singapore. Consumer perceptions outside the development process are beyond the scope of this study, but could be addressed in future research. Since the SR series centers on a floor mirror with complementary pieces, the products work together as a cohesive whole, unsuitable for independent analysis. Therefore, this study adopts a holistic single case study approach.

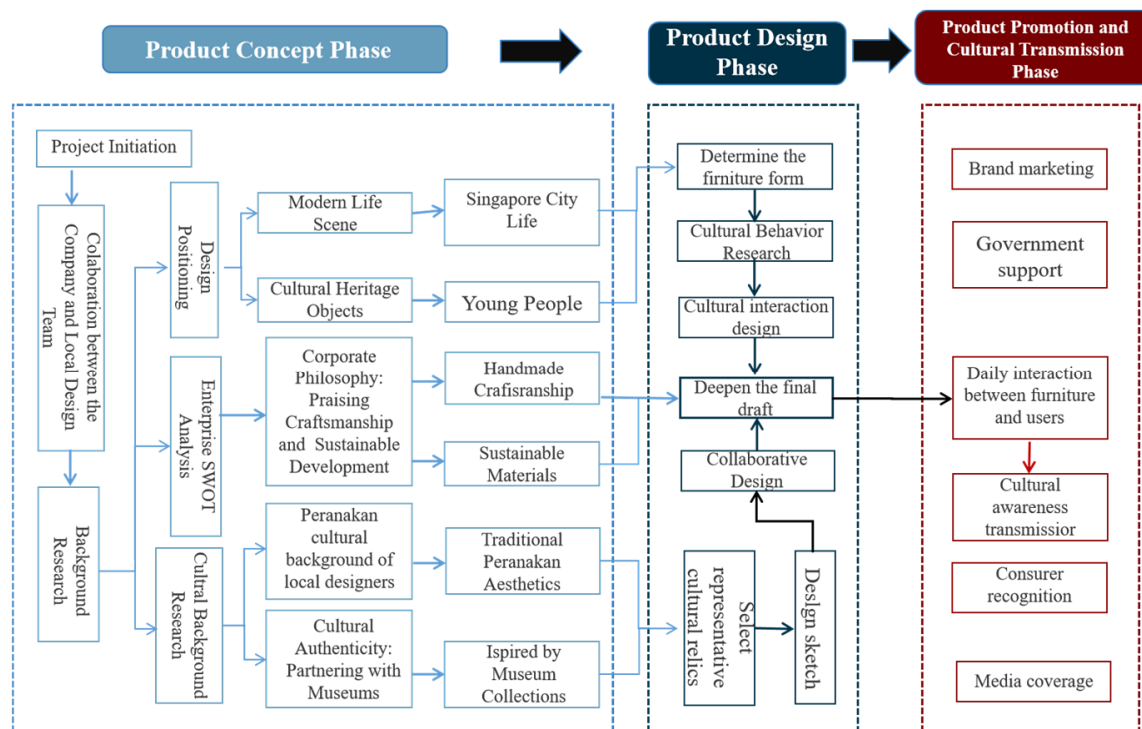


Figure 2. The development process of the “SR” furniture series as in the case of this study.



Figure 3. In 2018, this case won the “Made with Passion” brand award and other design awards issued by the Singapore government.

3.2. Data Collection

Data for this study were gathered from three primary qualitative sources: semi-structured in-depth interviews, documents, and physical artifacts. Triangulation of these data sources ensured the reliability of the findings. Although direct observation, a common method in qualitative research, was not feasible due to the retrospective nature of the case, the physical artifacts—furniture items—help to reconstruct the case.

The interviewees included product developers, design directors, and assistant designers. Documents reviewed consisted of design plans, official product descriptions, and media coverage related to the development of the SR series. Physical data, including videos and images of the furniture, were also analyzed. In total, 3 interview transcripts, 17 official documents, 14 media files, 7 physical product files (interactive videos), and 3 design documents were collected for analysis.

3.3. Data Analysis

Thematic analysis, a prominent method in qualitative research, was used to analyze the data [24]. After organizing the data in a computer system, ATLAS.ti24 software was used to create a data set and categorize data based on key research questions. This process followed the procedure outlined by Zairul [25,26], identifying key patterns or meanings that emerge within the data.

Based on the interpretivism paradigm, this study used affordance theory to reveal the essence behind this case in the process of thematic analysis to answer the research questions. Under the interpretivism paradigm, this analysis is divided into two stages: deduction and induction. In the deduction stage, 3 themes and 12 categories were generated based on the research questions and affordance theory: Furniture Design Affordances, Cultural Interactivity, and Broad Cultural Participation (Figure 4). They provide direction for the data induction in the next stage. The inductive phase involved generating new codes driven by the data itself. These codes were then categorized and aggregated into themes, revealing a multi-layered structure of furniture design strategies that support Peranakan Chinese cultural preservation. Key themes such as Cultural Integration and Expression, Modern Innovation Design in Furniture, Promotion and Sustainability, and Social Engagement and Education were identified through this process.

By interpreting the relationship between codes, categories, and themes, this study systematically addresses the research questions and offers a comprehensive analysis of strategies for future Peranakan Chinese cultural product design, particularly in the realm of furniture design.

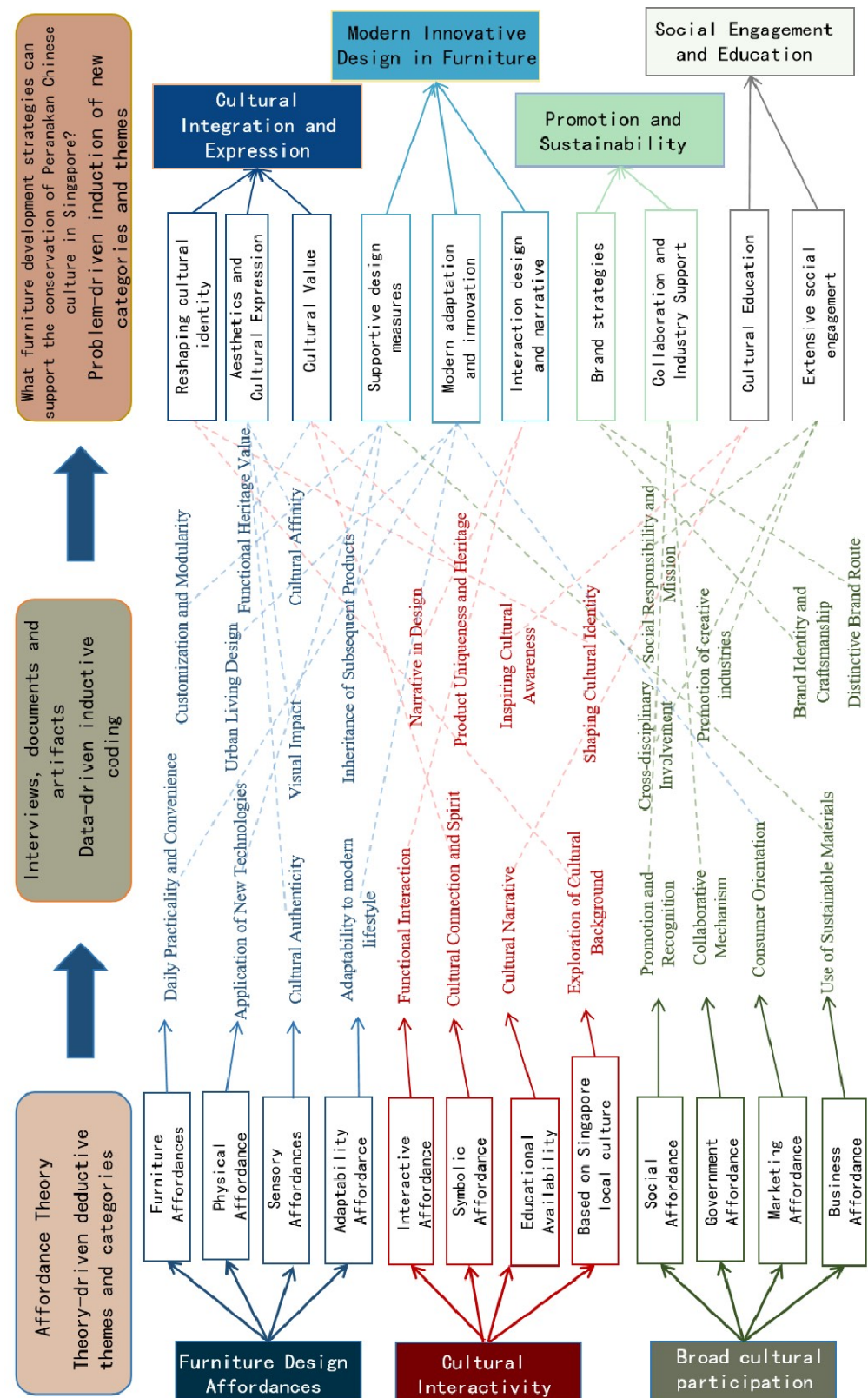


Figure 4. The deductive and inductive process of the themes-categories-codes in this study's data analysis.

4. Results and Finding

The data analysis process is divided into three parts: theory-driven deduction, data-driven induction, and research question-driven induction (Figure 4). Specifically, firstly,

under the guidance of the interpretivist paradigm, three themes were deduced based on the research questions and affordance theory before data analysis: furniture design affordance (blue), cultural interactivity (red), and extensive cultural participation (green), as well as twelve categories: furniture affordance, physical affordance, sensory affordance, adaptive affordance, interactive affordance, symbolic affordance, educational affordance, based on Singapore's local culture, government affordance, social affordance, marketing affordance, and corporate affordance. Then, guided by these themes and categories, thirty-five codes were summarized based on the collected data. Finally, these codes were summarized based on the research questions, resulting in twelve categories and four themes. The answers to the research questions can be revealed by interpreting these questions. Finally, these themes and categories outline a comprehensive approach to using furniture as a medium to effectively protect and inherit Singapore's Peranakan Chinese, ensuring its continued relevance and vitality in a modern context.

4.1. Theme 1: Cultural Integration and Expression

4.1.1. Category 1: Cultural Value

As a category, "Cultural Value" focuses on the significance of Peranakan Chinese culture to both history and modern Singaporean society. The three codes under this theme—"Cultural Connection and Spirit", "Product Uniqueness and Heritage", and "Functional Heritage Value"—each emphasize different aspects, but share an inherent connection, collectively supporting the core argument of the theme.

In the interviews, PT1 highlighted the unique representation of Peranakan Chinese culture within Singaporean culture:

"We were thinking, what original elements can you find in Singapore? Due to colonial rule, Singapore's culture has become very Westernized. But we also have strong Chinese, Malay, and Indian traditions. In our search, we came across the truly unique Peranakan Chinese culture..."

PT1 further emphasized how Peranakan Chinese culture deeply permeates the everyday life of Singaporeans and has become a symbol of cultural identity:

"I briefly explain this through everyday life. We can experience artifacts, fabrics... in some cases, certain clothes, customs. And of course, there's the museum as well."

In summary, the "Cultural Value" category reveals the profound sense of identity and belonging associated with Peranakan Chinese culture. It also highlights how the culture embodies Singapore's values of diversity and inclusivity, serving as a unifying thread for the nation's collective identity. The redefinition of cultural identity not only deepens consumers' connection to local culture, but also provides a clear path for the modern expression of traditional heritage, positively impacting the preservation and development of Peranakan Chinese culture.

4.1.2. Category 2: Reshaping Cultural Identity

The "Reshaping Cultural Identity" category encompasses two key codes: "Exploration of Cultural Background" and "Shaping Cultural Identity". Traditionally, cultural identity in Chinese communities has been heavily influenced by ancestral worship, equating cultural identity with ethnic lineage. This perspective has limited discussions about Peranakan Chinese and other Chinese subcultures to matters of ancestry and shared heritage. For the Peranakan Chinese, whose population has sharply declined, such a view could be seen as a direct challenge to the survival of their cultural identity.

However, PT1, the developer of the SR series, redefined the concept of cultural identity:

"Today, identity is no longer about where I come from. Identity is fluid. It means different things to different people. It provides opportunities for people to explore cultural identity."

This perspective offers a more flexible interpretation of cultural identity, moving beyond traditional ideas that tie identity strictly to ancestry. As a proponent of Peranakan

Chinese culture, PT1 believes that anyone who recognizes and values the culture can be part of it, thus broadening the cultural audience. This approach not only strengthens the foundation for the sustainable development of traditional culture, but also expands the population base for those who practice and identify with it.

By redefining cultural identity, PT1's viewpoint transcends the limits of bloodline and reshapes the concept, allowing for a broader demographic to engage with the culture. This strategy deepens the connection between consumers and local culture, providing a clear path for modern cultural expression and positively impacting the preservation and growth of Peranakan Chinese culture.

4.1.3. Category 3: Aesthetics and Cultural Expression

The "Aesthetics and Cultural Expression" category includes three codes: "Cultural Authenticity", "Cultural Affinity", and "Visual Impact". This category delves into the visual and artistic expression of Peranakan Chinese culture in furniture design, emphasizing that drawing aesthetic inspiration from authentic Peranakan Chinese culture is a critical starting point for furniture design. It focuses on integrating cultural visual and artistic elements into the design to create pieces that embody traditional charm while meeting modern aesthetic standards.

Exploring and refining the visual symbols of Peranakan Chinese culture is the first step in decorative design. It is essential to incorporate unique cultural symbols in the design that resonate with modern audiences. As products themed around Peranakan Chinese culture, it is crucial to extract culturally significant colors, patterns, and even cultural behaviors while maintaining cultural authenticity. This process, however, requires designers to possess a profound understanding of the culture. To achieve this, developer PT1 sought collaboration with local Singaporean Chinese designers PT2 and PT3, who, although not professional furniture designers, have a deep understanding of Peranakan Chinese culture due to their cultural backgrounds.

The aesthetics and cultural expression emphasize not only visual appeal, but also the positive impact that aesthetic design that follows authentic inspiration can have on cultural narratives. As Fokkinga and Desmet [27] point out, aesthetic design goes beyond mere functionality to incorporate emotions and cultural narratives that resonate with users. The designers in this case applied these principles by drawing inspiration from authentic cultural sources such as the Peranakan Museum and the TV series *The Little Nyonya*, integrating symbolic motifs like the "Tree of Life" and culturally significant colors derived from Nyonya ware. This approach ensured that the designs are not only visually appealing, but also emotionally resonant, fostering a deep cultural connection with users.

PT2: "Before the design project, I visited the museum to learn more. I realized that many prominent figures in Singapore have Peranakan roots. I think the TV show really helped, especially The Little Nyonya. It showcased lifestyles, beliefs, traditions, and also some of the challenges faced by the younger generation at that time... it really broadened our understanding of Peranakan culture."

Ultimately, the designers refined the patterns and colors from a traditional Peranakan bedspread, preserving its multicultural elements while redesigning them according to modern aesthetics. In addition, they incorporated a cultural behavior into the design of a mirror, where users could flip the mirror to avoid cultural taboos related to its placement. These strategies not only respect Peranakan Chinese culture, but also enhance the market appeal of the furniture while ensuring its role as a medium for cultural transmission (Figure 5).

PT1 commented, "It is called the Tree of Life. The flowers and many of the details are done in batik. This is the method used in Indonesian pattern design... even the Singapore Airlines stewardess and women's attire (kebaya) are based on batik."



Figure 5. The “Tree of Life” is based on the patterns in cultural relics and redesigned with multicultural elements: (a) designer’s sketch, (b) final pattern.

This further illustrates how modern Peranakan Chinese design can combine traditional art forms with contemporary needs, creating pieces that are both representative and relevant. This serves as a reference for the furniture design case in question, demonstrating how designers continuously draw aesthetic inspiration from the original culture to ensure that the designs possess cultural depth and emotional resonance. Moreover, regarding the aesthetic design of colors, PT3 mentioned:

“We did some research on the colors as well. Because we know the fabric itself is orange, blue, and white. So our first set was in that direction. Later, we also referred to some of the colors that often appear in Nyonya ware, which look like the colors of Nyonya porcelain.”

This shows the careful aesthetic considerations behind the designers’ choice of colors. They not only considered the visual appeal of the colors, but also their significance and symbolic meaning in cultural heritage.

After analyzing the categories of “Cultural Value”, “Reshaping Cultural Identity”, and “Aesthetics and Cultural Expression”, we constructed a comprehensive perspective on the theme of “Cultural Fusion and Expression”. Each category independently explores different aspects of cultural understanding, aesthetic expression, and integration with design, collectively forming a response to the research question from the perspective of cultural sustainability. These categories collectively demonstrate the diversity and depth of cultural fusion and expression in modern design.

4.2. Theme 2: Modern Innovative Design in Furniture

4.2.1. Category 1: Modern Adaptation and Innovation

The “Modern Adaptation and Innovation” category, through its four codes—“Daily Practicality and Convenience”, “Adaptability to Modern Lifestyle”, “Consumer Orientation”, and “Urban Living Design”—demonstrates cultural conservation strategies in the modern furniture design phase. These codes illustrate how designers integrate traditional cultural elements with contemporary design concepts, human-centered approaches, technology, and material innovation to accommodate the rapidly changing modern living environment and consumer needs.

This case shows how Peranakan Chinese cultural furniture design can cater to the demands of modern urban living. PT1 emphasized the need for lightweight, space-efficient furniture in modern households: *“We live in modern cities, especially in Singapore where*

everything is highly modernized. Houses are too small... we don't want big, heavy furniture". This highlights the design trend of accommodating compact living spaces and points to the adaptability and transformation of cultural traditions in modern design. PT3 further expanded on this view, stressing the importance of space-saving solutions and connecting with the younger generation through culture:

"...I believe that in the near future, Peranakan Chinese collections could consider this aspect, thinking in this direction or proposing more space-saving solutions... we are working to build a bridge between Peranakan Chinese culture, the younger generation, and modern life."

These statements emphasize that furniture design must not only focus on practicality and space optimization, but also explore how traditional culture can be integrated into products that align with modern urban lifestyles.

PT2, starting from the perspective of everyday essentials, believed that furniture design should prioritize meeting basic needs: *"We want to start with something that people need regardless. You look in the mirror every day"*. Additionally, PT3 noted how the choice of furniture form is closely tied to the demands of daily necessities, highlighting the importance of design acceptance:

"Since we're making daily-use products, you now need to consider whether to choose this design or another... because we need this product, I need this design... because these are items that are necessary in life."

By analyzing these codes, we observe how designers skillfully merge traditional culture with modern needs. Their innovations in the practicality and adaptability of the products—such as modularity and personalized customization—strengthen the cultural expression in a contemporary context. This fusion indicates that the preservation of Peranakan Chinese culture can be achieved not only through the replication of traditions, but also through the adaptation and innovation of modern design, thereby enhancing its relevance and influence in contemporary society.

4.2.2. Category 2: Interaction Design and Narrative

The "Interaction Design and Narrative" category includes two codes: "Narrative in Design" and "Functional Interaction". This category emphasizes the importance of storytelling through furniture design, making Peranakan Chinese culture interactive and engaging. The designers' approach is not only to create works that represent Peranakan Chinese traditions, but also to help people understand and connect with those traditions.

Designers integrate cultural behaviors with the practical functions of daily-use furniture, creating a human-centered interaction model. PT2 shared insights on "functional interaction for conservation", stating: *"If you turn a piece of history into a functional product, you interact with it daily. You'll remember it. It enriches your life and makes the past last forever"*. This highlights the intention behind converting cultural elements into functional products, as well as the role design plays in bridging the past with modern life. Moreover, we explore how the narrative and interactive elements of furniture design support and preserve Peranakan Chinese culture. PT2 proposed another development concept: *"...the way we tell the world the story of Peranakan Chinese culture is through furniture, placing it in an urban environment"*, emphasizing that, in this case, furniture serves as a storytelling medium for conveying cultural narratives. This development strategy is not only about aesthetic expression, but also about strengthening connections to Peranakan Chinese culture in a modern setting.

Additionally, nostalgia serves as another narrative element in the design. An official document mentioned the concept of "rooted cultural nostalgia": *"The nostalgic sentiment rooted in the culture forms the foundation of this series, telling stories through design aesthetics, materials, and craftsmanship"*. This underlines the importance of infusing nostalgia into design, which not only adds cultural depth to the products, but also evokes a sense of cultural memory and emotional connection among Singaporean users (Figure 6).



Figure 6. The color scheme is inspired by a Nyonya's childhood spoon, a color that evokes nostalgia for a generation.

4.2.3. Category 3: Supportive Design Measures

The "Supportive Design Measures" category includes four codes: "Customization and Modularity", "Inheritance of Subsequent Products", "Application of New Technologies", and "Use of Sustainable Materials". This category complements the main furniture design strategies previously discussed, such as functionality, interactivity, and narrative. While these supportive measures may not directly contribute to cultural sustainability, they enhance product flexibility and user acceptance. Specifically, "Customization and Modularity", "Inheritance of Subsequent Products", and "Application of New Technologies" reflect how designers use adaptable furniture solutions to improve the user experience.

In the interview, PT3 mentioned: *"We try some solutions, like some modular concepts, some customizable panel designs to provide a better experience. . ."* This demonstrates the designers' efforts to improve the user experience through customizable modular designs.

Regarding the application of new technologies, designer PT2 stated: *"We draw from the past, we draw from functionality, and we also draw from a future driven by technology in Asia, and we combine them. . ."* This approach integrates the past, functionality, and a future powered by technology, adapting to both contemporary and future environments. Meanwhile, we found a description in the company's product catalog (official document) that stated: *"...equipped with an air quality sensor and environmental temperature display (in Celsius)"*. This further clarifies the functional aspects of the products, showcasing how the designers incorporated advanced technological features into the design, providing both aesthetic appeal and practical functionality to meet users' daily needs (Figure 7).

Regarding the use of sustainable materials, PT2 explained: *"I think we are more focused on adopting the Peranakan Chinese story but using discarded materials to create the works... because it is a sustainable material (bone)"*. This illustrates how the designer integrated the Peranakan Chinese cultural narrative with eco-friendly concepts by utilizing discarded materials, thus infusing sustainability into the design.

In exploring the "Supportive Design Measures" category, we observed how the designers employed customization, modularity, inheritable design, and the application of new technologies to expand the product range, catering to diverse user needs. This not only enhanced the user experience, but also broadened the user base, thereby supporting the cultural sustainability of Peranakan Chinese heritage.



Figure 7. The makeup mirror is implanted with temperature sensors according to the needs of modern life.

4.3. Theme 3: Promotion and Sustainability

4.3.1. Category 1: Brand Strategies

The “Brand Strategies” category includes two codes: “Distinctive Brand Route” and “Brand Identity and Craftsmanship”. This category emphasizes the impact of unique furniture brand strategies on furniture design and its positive role in enhancing the influence of modern Peranakan Chinese furniture. Strategies in this area may include unique brand routes and brand identities that highlight the uniqueness of Peranakan Chinese furniture design. These strategies can focus on incorporating clever elements into the design to increase the attractiveness of furniture to users and enhance its influence in the industry with a unique brand image.

The core philosophy of the brand is to integrate profound cultural and social ideas into product design, while striving to maintain simplicity and practicality in conveying complex concepts. PT1 mentioned in an interview, “...as a brand, this is what we’ve always been trying to do...to think deeply about culture, society, the future of the world, conservation, sustainability. But turn it into a very simple product for consumers to use”. He further highlighted what sets the brand apart: “...this is what we love. It’s a humorous, fun brand element”. By incorporating elements of humor and surprise into the design, they enhance the brand’s appeal and increase consumer engagement.

Moreover, during the design research phase, the project developers prioritized cultural sustainability. They strategically positioned their target customers as young urban dwellers, aiming to highlight the uniqueness of Peranakan Chinese culture through design to gain this demographic’s recognition of both the culture and the brand.

As PT1 noted, “You have to attract the younger generation to protect the future of the past...we are working to build a bridge between Peranakan Chinese culture and the younger generation, as well as modern life.”

These strategies not only enhance the brand’s market influence, but also play a crucial role in cultural preservation and industrial support. The brand’s distinctive market positioning and design strategy have not only garnered a strong customer base, but also contributed to the promotion of Peranakan Chinese culture.

4.3.2. Category 2: Collaboration and Industry Support

The “Collaboration and Industry Support” category encompasses two codes: “Collaborative Mechanisms” and “Promotion and Recognition”. This category aims to establish a strong brand identity for Peranakan Chinese furniture, emphasizing high-quality craftsmanship and cultural authenticity. The goal is to create and solidify a unique market presence while contributing to the broader Peranakan Chinese cultural industry.

In this case, collaboration between the furniture company, designers, craftsmen, and museums at different stages sparked innovation and technological integration. This collaborative effort injected new life into Peranakan Chinese furniture design while preserving traditional values, thereby promoting cultural heritage.

The developers of the furniture company consistently collaborated with independent, renowned designers for product development. To ensure the successful launch of the SR series, PT1 selected local Singaporean designers, PT2 and PT3, who have Peranakan Chinese cultural backgrounds. Although they are not specifically furniture designers, their expertise in lifestyle product design and extensive experience in human–computer interaction design aligned with PT1’s vision of integrating modern products with cultural communication.

Additionally, the success of the SR series was closely tied to the support of the Peranakan Museum. With assistance from this authoritative cultural institution, the designers were able to thoroughly explore and refine cultural elements while maintaining authenticity.

“We didn’t just look at the museum’s exhibits; they also gave us access to the archives. The archives are like a database of all their collection’s photographs. Some of these items we had never seen before because they weren’t on display.”

Lastly, during the design phase, the collaboration between the designers and craftsmen was crucial. PT1 highlighted the important role of artisans and traditional craftsmanship in this design. While the designers oversaw the overall project, the craftsmen worked alongside them to deepen the design based on their skills, ultimately co-creating the final pieces.

PT3 said that: “...So our idea was to create some handmade pieces because all the art, craft, and Peranakan Chinese culture are handmade, so we preserved the handmade nature of the product. It’s not perfect. It’s handmade. It’s almost like an artist doing the work. . .”

It is noteworthy that this multi-layered collaboration among different stakeholders not only established a brand identity rooted in craftsmanship and cultural authenticity, but also fostered innovation and technological integration. This approach breathed new life into the Peranakan Chinese tradition, enabling the sustainable development of the culture. Designers should have a deep understanding of the culture, allowing them to creatively blend cultural elements with modern functionality and user interaction. By working alongside artisans in an equal partnership, both parties can enhance the decorative design of the products. Moreover, the contributions of cultural institutions, government bodies, media, and other social entities played an indispensable role in the project’s success. These collaborative mechanisms provided sustainable and innovative pathways for promoting and developing the unique culture of Singapore’s Peranakan Chinese.

4.4. Theme 4: Social Engagement and Education

4.4.1. Category 1: Cultural Education

This category includes two codes: “Inspiring Cultural Awareness” and “Cultural Narrative”. These codes emphasize raising awareness and educating both the Singaporean public and designers about the rich traditions of Peranakan Chinese culture. The goal is to deepen the understanding and appreciation of Peranakan Chinese culture through furniture design.

In the interviews, PT2 emphasized, *“To make it interesting, you have to appeal to young people to preserve the past for the future. . . we are trying to do something where*

we look back at history, we look back at the past, but we are moving into the future in a sustainable way and encouraging the final consumer to buy into tradition."

PT2 believes that young people represent the future and are crucial for the transmission and sustainable development of culture. Their attitudes and needs regarding traditional culture are key considerations for designers. These discussions suggest that by integrating modern design practices, attracting younger generations, and embedding cultural identity into design, culture can be effectively supported and passed on to future generations (Figure 8).



Figure 8. Project members introduce the furniture to young people to promote culture.

In conclusion, the “Cultural Education” category, through the codes “Inspiration and Sustainability” and “Cultural Narrative and Awareness”, demonstrates the importance of furniture design in preserving and promoting Peranakan Chinese culture. This approach not only enhances public engagement and promotion, but also encourages the maintenance of cultural vitality and relevance through continuous education and storytelling.

4.4.2. Category 2: Extensive Social Engagement

In the “Extensive Social Engagement” category, three codes—“Social Responsibility and Mission”, “Promotion of creative industries”, and “Cross-disciplinary Involvement”—collectively emphasize the significance of close cooperation and mutual support among entrepreneurs, designers, government entities, and institutions. More importantly, broad public participation is essential for cultivating cultural awareness and identity, which in turn increases the number of individuals practicing daily cultural traditions—a direct strategy to enhance cultural sustainability.

Designer PT2 highlighted this by stating: *“One of the reasons we are doing this is to get others interested, to inspire others, so that more people are not only interested in maintaining but also developing heritage, to keep it alive and create very interesting modern designs. . . I think this is also part of the education here—respect your culture and make an effort to maintain good practices, values, and heritage. So I believe we all share the same belief, we all want to do something for our heritage.”*

This demonstrates that designers, in the process of creating, also act as cultural communicators and educators with a strong sense of social responsibility. Additionally, developer PT1, as the project leader, exhibits social responsibility and a cultural mission, placing cultural preservation above commercial interests. This visionary pursuit, combined with trust in professional designers, was a key factor in the project’s success. Moreover, they

actively participated in social events and engaged with the public to foster wider societal involvement, amplifying the cultural impact.

In conclusion, “Extensive Social Engagement” highlights how the design community, through active social participation and cross-disciplinary collaboration, can foster public engagement with culture, making the execution of sustainable cultural development more deeply embedded in various aspects of society. In this way, design transcends mere artistic expression, becoming a bridge for cultural education and community involvement, paving the way for a culturally enriched and socially responsible environment in Singapore’s future.

5. Discussion and Conclusions

This study thoroughly examines a furniture series development case based on Singapore’s Peranakan Chinese culture to address the research question: What furniture development strategies can support the conservation of Peranakan Chinese culture in Singapore? Grounded in affordance theory, this research investigates how furniture development can serve as a vehicle for cultural sustainability by exploring three key aspects: furniture design, cultural interaction, and social engagement. Based on this and thematic analysis, this study identifies four overarching strategies—Cultural Integration and Expression, Modern Innovation Design in Furniture, Promotion and Sustainability, and Social Engagement and Education, each encompassing three specific sub-strategies, as key to achieving cultural sustainability by furniture development. These findings collectively offer a comprehensive response to the research question, providing actionable insights for designers, businesses, and policymakers.

Based on these strategies, this study constructs a “Furniture Development Conceptual Framework for Cultural Sustainability” (Figure 9). This framework involves key roles such as developers, designers, cultural institutions, governments, media, and the public, and includes critical stages like cultural expression, product innovation design, promotion, sustainability, and social engagement and education. Each stage uniquely contributes to integrating culture into the furniture development process, focusing on innovation and sustainability. Throughout the research, the following insights were formed.

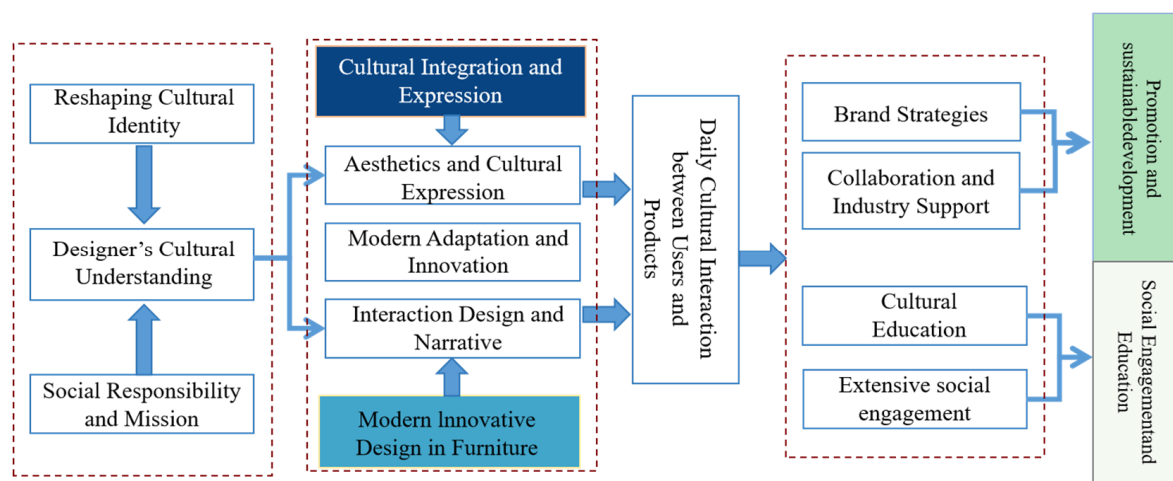


Figure 9. A conceptual framework for furniture development with cultural conservation as the goal.

The first finding of this case study emphasizes the importance of reshaping cultural identity for cultural sustainability. The Peranakan Chinese in Singapore represent a relatively insular and small group, and previous research on their cultural identity was mainly based on bloodline, history, or religious beliefs. Scholars have expressed concern that one of the challenges facing the Peranakan Chinese culture is the declining population practicing the culture [4]. However, this study demonstrates that by reshaping cultural identity, the traditional limitations of bloodline are transcended, expanding the base of individuals engaging with and practicing the culture.

Secondly, this study reveals that the authentic aesthetics of Peranakan Chinese culture in product design have a strong appeal, capable of delivering immediate visual impact. In contrast, long-term, subtle cultural transmission occurs through sustainable, daily human–object interaction based on cultural practices. This aligns with propositions in affordance theory within the fields of cultural heritage conservation and product design research [28].

This study suggests that narrative-based design is another essential strategy for maintaining cultural appeal. This echoes Grimaldi, S. et al.’s argument that narrative is a critical aspect of design, with objects serving as storytelling vehicles that deepen emotional connections between users and products [29].

Furthermore, as proposed by Haines-Gadd et al. [30], emotional persistence emphasizes the role of narrative and the connection between users and products in extending the relevance and lifespan of products. By incorporating culturally meaningful narratives and aesthetic features into Peranakan-style designs, furniture products can not only reflect their heritage, but also establish a lasting emotional bond with users, enhancing their role as everyday artifacts that facilitate cultural transmission and identity reinforcement. These approaches are consistent with the findings of this study, which emphasize the key role of cultural narratives in achieving sustainability and cultural preservation.

Previously, some designers proposed an innovative approach to heritage conservation by blending Peranakan Chinese artistic heritage with eco-friendly packaging, combining cultural memory with sustainable practices. They emphasized the importance of valuing the past while innovating for the future, which presents a forward-thinking perspective [21]. In this study, designers and developers have employed nostalgic or narrative design strategies to achieve cultural conservation.

Fourth, ensuring the affordance of furniture—its usability and relevance to everyday life—is not only a fundamental design principle, but also a key factor in the success of this case. This study emphasizes that merging the practical functionality of furniture with Peranakan Chinese cultural innovations based on the real needs of urban Singaporean users is another critical aspect of the project’s success.

Furthermore, this study identifies that broad social participation and cultural education, particularly among younger generations, are auxiliary strategies in this furniture development case for enhancing cultural influence. In alignment with this, Menkshi, E. et al. and Boonpracha, J. highlight the crucial role of youth participation in heritage conservation strategies and their impact on cultural sustainability [31,32].

Regarding the roles of participants in this case, this study argues that the social responsibility and cultural mission of the business owner and designers were direct subjective factors contributing to the project’s success. The business owner prioritized the promotion of Peranakan Chinese culture over economic gains, taking on commercial risks by trusting the designers’ innovative explorations and dedicating resources to advancing the project. Similarly, the designers were willing to engage in bold innovations without prior design references, conducting extensive cultural research far exceeding typical design efforts. Additionally, the active involvement of various social sectors and their collective support for traditional culture provided new perspectives on cultural development.

Ultimately, this study underscores the significant role design plays in cultural conservation, paving the way for future research to explore and expand the intersections of culture, design, and sustainability.

Author Contributions: Conceptualization, A.R.A.R.; methodology, W.H.; software, W.H.; formal analysis, W.H.; investigation, W.H.; writing—original draft preparation, A.R.A.R. and S.S.G.; writing—review and editing, S.S.G.; visualization, R.A.A.R.A.E.; supervision, A.R.A.R.; project administration, A.R.A.R. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: This study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of UPM/TNCPI/RMC/1.4.18.2 (JKEUPM) at 25 May 2022 (REFERENCE NO: JKEUPM-2022-336).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The participants of this study did not give written consent for their data to be shared publicly, so due to the sensitive nature of the research, supporting data are not available.

Acknowledgments: We would like to thank “I” Furniture Company from Singapore for its unreserved support including data for this research.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Darmayanti, T.E.; Bahaiddin, A. Rebuilding sustainable place through the embodied image of the peranakan chinese house: Study of Kidang Mas in Lasem, Indonesia through Juhani Pallasmaa’s perspective. In Proceedings of the 5th International Conference on Rebuilding Place, Banda Aceh, Indonesia, 15–16 September 2021; IOP Conference Series: Earth and Environmental Science. IOP Publishing: Bristol, UK, 2021; Volume 881, p. 012001.
2. Mansion, C.F.T. The environment and feng shui application in cheong fatt tze mansion, Penang, Malaysia. *Eco-Archit. VII Harmon. Archit. Nat.* **2019**, *183*, 1.
3. Lee, S.K. The Peranakan Baba Nyonya culture: Resurgence or disappearance? *SARI J. Alam Tamadun Melayu* **2008**, *26*, 161–170.
4. Henderson, J. Ethnic Heritage as a Tourist Attraction: The Peranakans of Singapore. *Int. J. Herit. Stud.* **2003**, *9*, 27–44. [\[CrossRef\]](#)
5. Gibson, J.J. The theory of affordances. Perceiving, acting, and knowing: Toward an ecological psychology. In *Perceiving, Acting, and Knowing: Toward an Ecological Psychology*; Routledge: London, UK, 1977; pp. 67–82.
6. Montsion, J.M.; Parasram, A. The Little Nyonya and Singapore’s national self: Reflections on aesthetics, ethnicity and postcolonial state formation. *Postcolonial Stud.* **2018**, *21*, 154–171. [\[CrossRef\]](#)
7. Chee-Beng, T. Structure and change: Cultural identity of the Baba of Melaka. *Bijdr. Tot Taal-. Land-En Volkenkd.* **1988**, *144*, 297–314. [\[CrossRef\]](#)
8. Huang, W.; Rahman AR, A.; Singh SS, D.; Effendi, R.A.A.R.A. Cultural Development on Peranakan Chinese a Thematic Review. *Adv. Humanit. Contemp. Stud.* **2024**, *5*, 31–56.
9. Guan, X. Immigration, ethnicity and nation: The construction and imagination of Chinese-themed museums in Singapore. *Mus. Q.* **2019**, *31*, 157–165.
10. Tan, C.B. *Chinese Religion in Malaysia: Temples and Communities*; Brill: Leiden, The Netherlands, 2018; Volume 12.
11. Lee, N.H. Utilizing the matched-guise as a method of examining perceptual change in an endangered creole. *Appl. Linguist.* **2021**, *42*, 207–229. [\[CrossRef\]](#)
12. Lee, T. Defining the Aesthetics of the Nyonyas’ Batik Sarongs in the Straits Settlements, Late Nineteenth to Early Twentieth Century. *Asian Stud. Rev.* **2016**, *40*, 173–191. [\[CrossRef\]](#)
13. Zanzaizman, M.N.A.; Sheikh Mohamed Safri, S.N.S.S.; Abdul Latip, M.S. Baba Nyonya Peranakan ethnic food: Exploring the effect of media influence and curiosity on consumption intention of the youth generation. *Young Consum.* **2023**, *24*, 577–595. [\[CrossRef\]](#)
14. Eng, R.Y. The Little Nyonya: Reframing confucian filiality and family rituals for a global Singapore. *Continuum* **2020**, *34*, 678–689. [\[CrossRef\]](#)
15. Teoh, K.M. Domesticating hybridity: Straits Chinese cultural heritage projects in Malaysia and Singapore. *Cross-Curr. East Asian Hist. Cult. Rev.* **2015**, *1*, 115–146. [\[CrossRef\]](#)
16. Abdulqader, O.Q. The Simplicity in the Generating of Peranakan Interior Space Shophouse in Georgetown, Penang. In Proceedings of the XIX Generative Art International Conference, Florence, Italy, 15–17 December 2016.
17. Darmayanti, T.E.; Bahaiddin, A. Cultural heritage of the peranakan batik Kidang mas house of Lasem, Central java, Indonesia. *Int. Trans. J. Eng. Manag. Appl. Sci. Technol.* **2020**, *11*, 1–14.
18. Khuluqiyah, R.A.; Delijar, R.M. Pelestarian Budaya Peranakan Tionghoa Wayang Potehi pada Masa Pandemi COVID-19. *J. Cakrawala Mandarin* **2022**, *6*, 150–159. [\[CrossRef\]](#)
19. Norman, D.A. *The Design of Everyday Things*; Doubleday: New York, NY, USA, 1990.
20. Rakhim, D.; Vermol, V.V.; Legino, R. Designing Movable Kitchen Cart through the Elements of Traditional Baba Nyonya House. *Environ.-Behav. Proc. J.* **2021**, *6*, 41–46. [\[CrossRef\]](#)
21. Yeoh, P.S.; Vongphantuset, J.; Sirivesmas, V. The development of Peranakan influenced package design using palm paper. *Humanit. Arts Soc. Sci. Stud. (Former Name Silpakorn Univ. J. Soc. Sci. Humanit. Arts)* **2021**, *21*, 425–435.
22. Creswell, J.W.; Creswell, J.D. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*; Sage Publications: New York, NY, USA, 2017.
23. Yin, R.K. *Case Study Research and Applications*; Sage Publication, Inc: New York, NY, USA, 2018.
24. Braun, V.; Clarke, V. Using thematic analysis in psychology. *Qual. Res. Psychol.* **2006**, *3*, 77–101. [\[CrossRef\]](#)
25. Zairul, M. A Thematic Review on Student-Centred Learning in the Studio Education. *J. Crit. Rev.* **2020**, *7*, 2.
26. Zairul, M.; Zaremohzzabieh, Z. Thematic Trends in Industry 4.0 Revolution Potential towards Sustainability in the Construction Industry. *Sustainability* **2023**, *15*, 7720. [\[CrossRef\]](#)

27. Fokkinga, S.F.; Desmet, P.M. Ten ways to design for disgust, sadness, and other enjoyments: A design approach to enrich product experiences with negative emotions. *Int. J. Des.* **2013**, *7*, 19–36.
28. Norman, D.A. *Emotional Design: People and Things*; Basic Books: New York, NY, USA, 1 February 2005.
29. Grimaldi, S.; Fokkinga, S.; Ocnareescu, I. Narratives in design: A study of the types, applications and functions of narratives in design practice. In Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces, Newcastle upon Tyne, UK, 3–5 September 2013; pp. 201–210.
30. Haines-Gadd, M.; Chapman, J.; Lloyd, P.; Mason, J.; Aliakseyeu, D. Emotional durability design nine—A tool for product longevity. *Sustainability* **2018**, *10*, 1948. [[CrossRef](#)]
31. Menkshi, E.; Braholli, E.; Çobani, S.; Shehu, D. Assessing youth engagement in the preservation and promotion of culture heritage: A case study in Korça City, Albania. *Quaest. Geogr.* **2021**, *40*, 109–125. [[CrossRef](#)]
32. Boonpracha, J. Arts and culture as creative learning of students through cultural product design. *Creat. Stud.* **2022**, *15*, 364–375. [[CrossRef](#)]

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.