Jomard Publishing

NEW DESIGN IDEAS FROM TRADITIONAL CULTURE THROUGH ARTFUL THINKING: STUDY CASE ON PRODUCT DESIGN

Devanny Gumulya*, Fenny Meilani

Pelita Harapan University, Tangerang, Indonesia

Abstract. Every country has a distinct and rich cultural heritage that serves as a valuable source of inspiration. This study will go over how to use this resource in product design. The study intends to investigate the feasibility of combining artful thinking (AT) with the cultural product design (CPD) process in order to generate new design ideas from traditional culture. Based on a review of literature on six artful thinking routines and cultural design process, and a product design project that apply the thinking routines on the cultural design process, we find that artful thinking supports and enhances the cultural design process. The Artful Thinking (AT) approach guides designers through a series of thinking routines that foster critical thinking and deeper engagement with traditional cultural design elements, resulting in a stronger resonance with these elements. Furthermore, the paper establishes a cultural product design framework embedded with artful thinking routines to provide designers with a valuable reference for creating a more in-depth and meaningful culturally inspired innovative design. Our research contributes valuable insights into the integration of six artful thinking routines within the five steps of the cultural product design process. Additionally, we propose an innovative framework for effectively transforming traditional knowledge into contemporary society. This pioneering approach opens new avenues for advancing cultural product design and enriching our understanding of the dynamic interplay between tradition and modernity.

1. Introduction

Indonesia, a vast archipelago of more than 17,000 islands, has a population of approximately 276 million people, making it the world's fourth most populous country (Worldbank, 2021). These impressive figures also suggest that significant cultural, ethnic, religious, and linguistic diversity can be found within its borders. Paintings, sculpture, music, dance, theater, and other inspired works of art and design are produced by Indonesia's rich culture. From ancient times to the present, Indonesian artists and designers have drawn inspiration from the archipelago's culture, values, and nature, ensuring that the art scene remains vibrant and evolving.

Traditional culture, which has been passed down through generations, has demonstrated excellent qualities that can inspire designers to innovate. Traditional culture is the culmination of thousands of years of practice and collective wisdom. It is a harmonious balance of aesthetic and function, physical and ideological purpose, economic and environmental decision (Nugraha, 2005). Hence, it is a national treasure

that must be valued and treasured, particularly in today's global market, where products are losing their identity because they are similar in function and form.

Traditional culture brings distinct feature in product design and this strengthen its identity in the global market and to improve customer experience (Qin *et al.*, 2019). At this stage in the process, the role of product designers is absolutely essential in terms of incorporating cultural elements into products. As a consequence of this, the process of design is an interesting subject worthy of investigation.

To translate cultural features, designers must first learn about traditional cultures and understand the unique characteristics of each culture, which requires critical thinking. One method to nurture critical thinking is through artful thinking (Tishman, 2017). Artful thinking is a way of thinking that involves finding, examining, and considering the numerous details that make up works of art (Harvard, 2016). This process of observation and study teaches students to observe and analyze their surroundings—skills that form the foundation of critical thinking more closely. In addition, cultural objects are one of visual art forms.

The purpose of this paper is to investigate how to translate cultural elements into design elements using an artful thinking approach. The paper proposes a cultural product design model that can serve as a useful reference for designers when creating successful product designs with strong cultural identities. The findings presented here provide a framework for designers to use in the design process to integrate their aesthetic sensibility with cultural elements. The cultural product design framework is applied to a product design student's design process.

2. Literature Review

Artful Thinking (AT)
A series of organized thoughts that seek to establish a link between art and thinking. It is a pedagogy developed in 2016 by the Harvard School of Education (Tishman & Palmer, 2006). Artful thinking consists of 6 thinking dispositions:" observing & describing, questioning & investigating, reasoning, exploring viewpoints, comparing & connecting, finding complexity and taking perspective."

1. Observing and describing routines is noticing and communicating feelings (including emotional and sensory impressions) about the work of art. This area's routines place an emphasis on careful and comprehensive observation, self-awareness, and detailed explanation. Important questions: What are your findings? What are the specific details?
2. Questioning & investigating-centered routines is about stimulating curiosity and guiding inquiry by asking questions. Routines in this area concentrate on asking good questions, becoming responsive to puzzles and ambiguities, and identifying and exploring problems. Central questions: What do you see? What do you think? What do you wonder? What do you want to learn? The routine begins with describing what is seen, followed by thinking and wondering about what has just been seen.
3. Reasoning-centered routines are the formation of well-reasoned interpretations and ideas by emphasizing the use of evidence, the capture of key meanings, and the telling of well-reasoned stories that explain why things are the way they are. The central questions are: What do you think is going on, in your opinion? What are your justifications?

4. Comparing and connecting-centered routines involve using imagination to draw insightful comparisons and connections. This category of thinking routines focuses on making comparisons and analogies, as well as investigating the power of verbal and visual metaphors. The central Questions: What else is there to say? How does it relate to other things you know?

5. The complexity-centered routines emphasize seeing things in their dimensions, layers, and complexity. Thinking routines in this domain are concerned with revealing multiple dimensions, discovering layers, and investigating parts/purposes relationships. Central questions: How complicated is it? What are its various layers and components?

6. The routine centered on perspective taking is about developing insight by viewing things through different lenses or points of view. This area's routines emphasize perspective-taking, role-playing, empathy, and viewing the world through disciplinary lenses (e.g., thinking like a historian). The central questions are: What different perspectives could you take on it? How does it appear from various angles?

In addition Tishman & Palmer (2006) assert that AT can be achieved if it is practiced on a regular basis and documented properly, with students being present in thought and actively participating in the discussion. Both also developed the assessment tool "the continua" to assess the qualities of artful thinking.

Table 1. The Artful thinking accessment tool: The Continua

Criteria			
Obvious			**Beyond the given**
1 Doesn't go beyond the given information	2	3	4 Explores beyond the obvious, find new applications, questions, and connections.
Fuzzy			**Clear and focused**
1 Unfocused, disorganized, rambling. Misplaces ideas or goals.	2	3	4 Thinking is structured and has clear objectives. Well-organized around main ideas.
Simplistic			**Elaborated**
1 Oversimplified, lack of detail, generalized, broad.	2	3	4 Rich in detail and nuanced
One-dimensional			**Multidimensional**
1 Covers 1 topic lacks complexity, and other perspectives.	2	3	4 Touch different topics and has complexity and other perspectives.
Restricted			**Generative**
1 Close-minded, biased, and not interested in big ideas or tough questions.	2	3	4 Open-minded, creates new lines of inquiry, and broadens understanding.

Missed the point			Essence-capturing
1	2	3	4
Off topic and missed key themes, traits, or elements			Captures the essence and has depth. Identifies themes, traits, or elements.

According to current AT research (Lowe *et al.*, 2013) Artful thinking was used to enhance the reflective process in difficult teaching situations, and it was discovered that AT is proven to enhance the reflective process by structuring it as part of an action-based reflective model.

Cultural Product Design (CPD)

There are various definitions of culture, but in general, culture is defined as a society's way of life. From design perspective, Lee (2004) proposed a culture framework with multiple layers, including layers representing artifacts, tradition, and values. Physical or material cultures are the physical aspects of a society. They are human-made or modified objects used to survive, define social relationships, represent aspects of identity, or benefit people's mental, social, or economic standing. The example of material cultures are arts, architecture, food, music instruments, and garments. Social or behavioral culture are the human relationship and social organization within society like traditions and customs. Spiritual culture is the belief system of society for instance religion, belief, myth and stories. Each layer holds its own cultural features, which can be thought of as a distinctive quality or characteristic that is exclusively associated with the culture (Gumulya & Meilani, 2022). Cultural product design is the process of redefining cultural features in order to create new products that can fit and satisfy contemporary society's aesthetic and cultural needs (Hsu *et al.*, 2011).

Lin (2007) used emotional design theory in his research to translate cultural features to design features. The theory asserts that certain designs can affect users' emotions at three cognitive levels: visceral, behavioral, and reflective (Norman, 2005). Each cultural layer has its own set of design features. The material cultures provide visceral design features like color, texture, form, shapes, details, pattern, and decorations. Social cultures provide behavioral design features like function, operational concerns, usability, and the making process. Spiritual cultures provide reflective design features like stories and meaning.

In addition in his research Lin (2007) formulates the process of cultural product design process:

1. Investigation/setting a scenario: First, designers need to investigate the material, social, and spiritual culture. Then they identify the design elements of each cultural layer, including those associated with visceral (form, shapes, color, texture, and pattern), behavioral (function, usability, and making process), and reflective design elements (meaning, values, and storytelling). After they have identified design elements of each cultural layer, they select one inspiration from any cultural layer and seek a scenario that incorporates all three design elements. Through the identification process, the designers can obtain design information from a cultural layer and then evaluate and utilize this information to create the scenario.

2. Interaction/telling a story: in this stage designers focus on observing user to see whether the proposed scenario fits and has meaning to current lifestyle. Therefore,

some interactions between designers and users are required to confirm or clarify why a consumer requires the product and how to design the product to meet the user's needs. At this point, the designers have gained some depth and practice experience with these design features while also being able to relate this design knowledge to design problems in modern society, resulting in an appreciation for the interaction between culture, technology, and society.

3. Development/script writing: After gathering insights from users, the scenario may need to be tweaked during this stage to transform the cultural meaning into a reasonably correct cultural product. The next step is to convert design information from a selected cultural object into a concept and design realization. The concept is developed in text and sketches. In this stage designers need to be flexible and creative combining their aesthetic sensibility with the design elements from the cultural features.

4. Implementation/designing a product: in this step all design elements from cultural features are listed in a matrix table to help designers to check the cultural features being applied in the design process. In addition, the table helps designers to select the best design and to evaluate the features, meaning and the appropriateness of the product. The best design is then prototyped and evaluated by the target market.

After reviewing previous research on artful thinking and cultural product design, authors discovered that the studies that linked both paradigms in design research are still very rare. As a result, the authors propose that AT can enhance the CPD design process and poses these research questions.

1. How do observing and describing thinking routines enrich the investigation stage of the cultural product design process?
2. How do questioning and investigating thinking routines enrich the investigation stage of the cultural product design process?
3. How do reasoning thinking routines enrich the interaction stage of the cultural product design process?
4. How do comparing and connecting-centered thinking routines enrich the development stage of the cultural product design process?
5. How do perspective-taking thinking routines enrich the development stage of the cultural product design process?
6. How do complexity-centered thinking routines enrich the implementation stage of the cultural product design process?

3.   Method

The study adopts a qualitative exploratory research design to address its research objectives. The study is exploratory in nature because the research questions have not been thoroughly studied previously (Jali *et al*., 2021). To answer the research questions, we explore the relevant research about artful thinking and cultural product design. After learning about AT and CPD, we conduct design activities as part of the research process (Zimmerman & Forlizzi, 2014). In this study, the design activities are carried out through a final project undertaken by a product design student, focusing specifically on jewelry design. Jewelry holds a unique significance to individuals, as it is deeply personal and often symbolizes cultural expressions. Consequently, the logical choice is to incorporate elements of local culture into the jewelry design process. Through an extensive literature

review and hands-on experience implementing artful thinking routines within the cultural product design process, this study proposes an enhanced CPD framework enriched by artful thinking routines. This framework serves as a valuable contribution, providing a systematic approach to integrating AT into CPD practices.

4.   Result and Discussion

The outcomes are described in terms of CPD stages, with artful thinking being integrated at each stage.

Table 2. Research Result

Stages	Artful Thinking Routine	Results
Investigation the design elements from each cultural layer	Observing and describing The central Questions are: What are your findings? What are the specific details?	The student, Fenny, observes her own traditional culture. She comes from East Borneo, Indonesia, to be specific she investigates one of Borneo Tribe Culture, Dayak Kenyah. She observes the three cultural layers of Dayak Kenyah. She visited the local museum and observed the material culture: traditional attire and fabric, jewelry, martial arts, and traditional houses. The designer's observational skills are put to use at this stage. **Figure 1.** Observing and describing Dayak Material Culture She sees that Dayak material culture has bold and abstract geometric patterns, vibrant color combinations, and the intricate details of the thread and bead weaving pattern (see figure 1). She notices that one of the most interesting Dayak behavioral cultures is the tradition of ear lengthening, which is nearly extinct due to modernization. She also observes Dayak people often sitting in their traditional houses, talking with their friends, and embroidering beads. She notices that the Dayak Kenyah people are religious. The majority of them are Muslims. Dayak people believe that their ancestors protect them. As a result, they make an offering to their ancestor on certain occasions.

Setting a scenario that fits all three cultural layers	Questioning & investigating-centered routines is about stimulating curiosity and guiding inquiry by asking questions. The central questions are: What do you see? What do you think? What do you wonder? What do you want to learn?	Prior to creating the scenario, the author advises the designer to create a mind map to map out all what she had seen in the previous stage. Mind map is a visual diagram that shows the relationship between the main topics. From the mind map the designer thinks to concentrate on the Dayak culture's tradition of ear lengthening. She chose it because the tradition is unique and does not exist in any other culture. At this point, she wonders about how the tradition came to be alive, what the process is, why people do it, and what it means to the Dayak people. She wants to learn the reason and the motivation behind the tradition.

Figure 2. Questioning & investigating Dayak Culture

Through her interactions with the local community, especially the elderly, she gains valuable insights. It becomes apparent that the practice of elongating earlobes among the Dayak ancestors originated as a means of setting themselves apart from the animal kingdom (see figure 2).

Dayak women first pierced their ears with bamboo to extend their ears since they were three years old. Then every year, usually on their birthday, they began inserting earrings weighing 20 grams one by one. When women celebrate their birthdays, it is customary for them to wear another earring to extend their ear. Because of the weight of the earrings, the ear lobe begins to extend.

She discovered the meaning and motivation behind Dayak women's desire to extend their ears, which was originally used to distinguish between humans and animals but came to represent beauty, endurance, and social status as civilization progressed. Beauty is a process for Dayak women. Beauty that comes from enduring the pain of stretching their ears. Furthermore, the types of earrings worn denote social status.

Based on the expert interview, it was revealed that the practice of ear elongation was prohibited by the local government in 1976 due to its perceived primitiveness and potential hazards (see figure 4). As a consequence, some women had their ears forcefully cut, while others who wished to maintain the tradition were compelled to relocate and live in seclusion. Additionally, schools refused to admit girls with elongated ears. Consequently, the custom gradually diminished, and today it is predominantly observed among the elderly population.

Figure 3. Questioning & Investigating The Tradition of Ear Lengthening

Drawing upon the data, the designer makes a conscious choice to uphold the Dayak tradition of elongated ears by conveying the message that beauty necessitates patience and resilience within contemporary society. Opting for jewelry as the medium, she firmly believes that this message remains highly pertinent to women in the present era. Through her design, she aims to instill an appreciation for the value of time and perseverance, offering a thoughtful reinterpretation of the Dayak tradition within the realm of modern jewelry design.

Interaction between cultural values and contemporary society's need	Reasoning thinking Reasoning-centered routines are the formation of **well-reasoned interpretations and ideas** by emphasizing the **use of evidence, the capture** of **key meanings**, and the telling of well-reasoned stories that explain why things are the way they are. The central questions are: What do you	At this stage, the designer endeavors to gain a deep understanding of the profound significance behind the act of ear elongation among the women. Despite the inherent pain involved, these women firmly believe that enduring the process will not only enhance their beauty but also cultivate inner strength. The designer finds herself contemplating how to seamlessly integrate this profound meaning into contemporary jewelry designs for women. She seeks to capture the essence of strength and beauty derived from overcoming challenges, aiming to create jewelry pieces that serve as empowering symbols for modern women. The designer also researches extreme beauty in other cultures to answer the central question what do you think is going on? In China, foot binding was a practice that involved breaking and firmly binding the feet of young girls in order to change their size and shape and to force them to wear lotus-shaped shoes because it was believed that women with smaller feet had higher status (Foreman, 2015). (see figure 4). **Figure 4.** Foot Binding Tradition in China

think is going on, in your opinion? What are your justifications?

In Myanmar, Padaung tribe has a tradition of women stretch their neck (see figure 5). It is customary for Padaung women to wear a coil of brass rings around their necks from an early age. Their brass collars, along with the elongated appearance it gives over time, are Padaung symbols which they proudly wear. The brass collars can weigh up to 20 kg. The process is extremely painful and difficult because it changes the shape of the throat and affects the vocal cords. In their native Myanmar, the Padaung people were frequently persecuted in Myanmar for their visible tribal symbols. This centuries-old custom is now being carried on by Padaung women (now living in a Thailand refugee camp), who maintain a link to their tribe's history and remember the struggles of the past (Korzhov & Kovalenko, 2013).

Figure 5. Long Neck Tradition in Myanmar

In Ethiopia, Surma tribe has a tradition of slashing girls' skin with razor blades to create prominent scars (see figure 6). It is regarded as beautiful in Ethiopian tribal societies. In the Surma tribe, tolerating pain indicates a girl's emotional maturity and willingness to bear children. Scarifications are a sign of beauty in the tribes. Scarring is also practiced by various African tribes as a form of body art, symbolism, and beauty. However, health risks have recently been linked to the practice, as sharing knives has resulted in the spread of Hepatitis and, in some cases, Aids. Some people are abandoning the practice for a range of reasons, including religion, identification, social judgment, and negative connotations.

Figure 6. Scarifications Tradition in Ethiopia

In Ethiopia, women in the Mursi tribe wear wooden lip plates as a symbol of beauty and identity (see figure 7). When a girl reaches the age of 15 or 16, her lower lip is cut (sometimes by her mother) and held open by a sodden plug until it heals. The girls decide how far the lip should be stretched. The excruciatingly painful process frequently lasts several months. Men regard it as a sign of beauty, and women with lip plates are very proud of this figurative part of their heritage and identity. Women who do not carry lip plates are considered undesirable and do not deserve as large a bride fortune. Lip plates can be made of wood or clay, but clay is more commonly used. Often adorned with patterns and paint derived from local resources, particularly the lip plates of Mursi villages (Mishhov, 2021).

Figure 7. Mouth Stretching Tradition in Ethiopia

Through extensive research into diverse extreme beauty cultures across different regions, the designer unveils a profound revelation. She discovers that in numerous cultures, the essence of beauty is intricately intertwined with the arduous journey of enduring hardships, highlighting the fact that beauty encompasses not only physical attributes but also inner resilience and fortitude. It becomes evident to the designer that young girls who successfully conquer adversity are deemed ready to transition into womanhood.

Armed with this newfound understanding, the designer acknowledges that the universal desire for beauty transcends cultural and temporal boundaries. With resolute conviction, she embarks on a mission to create a contemporary collection of earrings by drawing inspiration from the distinctive shapes of extended earlobes (representing the material culture) and the traditional process of wearing Dayak earrings (reflecting the behavioral culture). Her ultimate objective is to imbue these jewelry pieces with a profound message that resonates with women worldwide: that beauty is an enduring journey, requiring strength and resilience to be fully realized.

Development combining designer's aesthetic sense with the cultural design elements	Comparing and connecting-centered routines involve using imagination to draw insightful	The designer at this stage elaborates the design proposal in more detail by creating a mood board (refer to figure 8). She draws inspiration from all the cultural layers to ensure that the design is culturally relevant. From the material culture, she incorporates the asymmetrical shapes of the earlobe, the shapes of the Dayak's ear, and bamboo into her design. From the behavioral culture, she integrates the way Dayak women wear their earrings. Lastly, from the reflective culture, she incorporates the meaning that beauty is a process of enduring hardships, which strengthens one's mental capacity.

comparisons and connections.	To answer the question of What else is there to say? and How does it relate to other things you know? She connects the inspiration from the culture with her own aesthetics sense which is bold and sculptural.
The central Questions: What else is there to say? How does it relate to other things you know?	

Figure 8. Design Inspiration Mood board

Perspective-taking is about developing insight by viewing things through different lenses or points of view.	The designer makes the concept of endurance the central theme of the jewelry collection. Through research of the Dayak language, she discovers that the local word for beautiful is "Manei." Inspired by this, she names her jewelry collection "Manei Sekuq," which means "You are beautiful." The name symbolizes the belief that every woman possesses her own unique beauty. The design language of the collection will be bold and sculptural, reflecting the idea that beauty is attained through overcoming challenges and emerging as a stronger individual.
The central questions are: What different perspectives could you take on it? How does it appear from various angles?	Furthermore, the designer decides to draw inspiration from the entire process of extending the ear. By considering various perspectives, she ensures that the design captures the essence of the journey and the transformative nature of beauty.
	Design 1
	Inspired by material culture: the earring and ear shapes.
	For Dayak women the first step of extending the ear is to pierced ear with bamboo, designer take the shape and texture of bamboo to create the design (see figure 9).

Figure 9. Design 1

Design 2

After the ear is pierced, the Dayak women start gradually use heavy earring to extend their ear. From this process the designer takes the irregular shapes of ear (see figure 10).

Figure 10. Design 2

Design 3

Inspired by behavioral culture: the way Dayak women wear their earrings. Another design is inspired by the way Dayak women put on earrings. The earring has spiral forms because they must be slowly rotated until they reach the end (see figure 11).

.

Figure 11. Design 3

| Implementation design the cultural product design	Complexity-centered thinking routines in this domain are concerned with revealing multiple dimensions, discovering layers, and investigating parts/purposes relationships. The central question: How complicated is it? What are its various layers and components?	At this stage, the designer has developed three unique designs that are inspired by different aspects of Dayak culture. Two of the designs draw inspiration from the material culture, specifically the bamboo earrings and the irregular shape of the elongated earlobe. The third design is inspired by the behavioral culture, specifically the ritual of wearing heavy earrings to extend the earlobe gradually over time. This ritual represents the Dayak women's enduring commitment to beauty, even through discomfort and weight. The designer has carefully considered all cultural layers to create designs that authentically capture the essence of the Dayak tradition while also incorporating a modern aesthetic. The resulting designs are bold, sculptural, and visually striking, symbolizing the idea that true beauty comes from endurance and perseverance. Finally, the designer concludes that it is all connected because heavy and bold earrings are required to extend the ear, and by rotating the earrings, the ear becomes more stretched. The new jewelry design is intended to represent the cultural value of Dayak Culture, but not by asking modern women to extend their ears, but by offering them jewelry that represents the meaning of the Dayak long ear tradition. Because neither ear is the same length, the designer decides to make earrings that differ from left to right. The various earrings also represent that beauty does not always come from perfection and that things do not always have to be in symmetry to be considered beautiful. To translate all the ideas into real jewelry. All designs are sketched, modelled in computer-aided design software, and prototyped with 3D printing. The designs are then wax carved to create a mold for casting the silver, which is then coated with 24 K gold (see figure 12).

Figure 12. Ideas to Prototype

Design 1 is set of earrings with bamboo and Dayak's women ear as inspiration. The left earring of design 1 is taken from the bamboo shapes and texture. The earring size is big to represent that the women is brave enough to start the journey of extending their ear by first piercing their ear with bamboo (see figure 13).
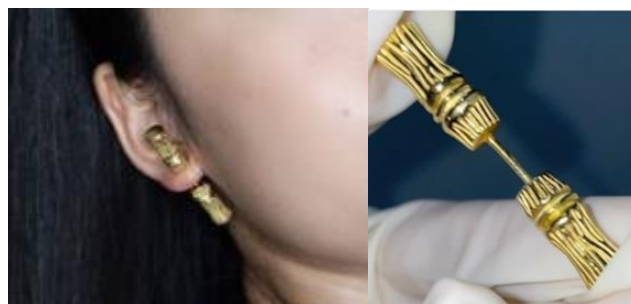
Figure 13. Design 1 Prototype Left Earring

The right earring of design 1 is taken from the irregular shapes and forms of the extented ear (see figure 14).

Figure 14. Design 1 Prototype Right Earring

Design 2 is another set of earrings that are inspired by the shapes and the custom of adding another earring each year as a symbol of strength. For the left earring, she creates an earring inspired by the shape of an elongated ear (see figure 15).

Figure 15. Design 2 Prototype Left Earring

For the right earring, she creates modular shapes with jump rings used to connect each module (see figure 16). The modular earring design is to give the impression that modern women, like Dayak women, can wear as many earrings as they want.

Figure 16. Design 2 Prototype Right Earring

Design 3 is developed based on the way of Dayak women put their earring.

Design 3 left earrings features a thin, delicate shape that elegantly accentuates the rotating motion of inserting the earrings. The shape is intentionally kept subtle to showcase the beauty of the elongated earlobe without overwhelming it with a bold design (see figure 16).

Figure 17. Design 3 Prototype Left Earring

Right earring design 3 draws inspiration from the wrinkled texture of elongated ears, paying homage to the Dayak women who have preserved this cultural tradition, particularly the elderly. The design incorporates textured elements that mimic the unique characteristics of the elongated earlobe, symbolizing the wisdom and experience of those who have carried this tradition throughout their lives (see figure 17).

Figure 188. Design 3 Prototype Right Earring

Figure 19. Earring Design 1

Figure 20. Earring Design 2

Figure 21. Earring Design 3

As part of the design process, the students' progress and artistic thinking abilities were evaluated by three esteemed product design lecturers who served as experts in the field. This evaluation utilized the Continua Artful Thinking Evaluation Scale, a comprehensive framework designed by the harvard school of education researchers to assess the students' artistic thinking skills (Tishman & Palmer, 2006). The assessment took place in a dynamic forum group discussion format, where the experts engaged in constructive dialogue, deliberation, and consensus-building to assign scores and determine the points showcased in Table 3. This collaborative approach ensured a well-rounded and balanced evaluation process that incorporated diverse perspectives and expertise. By employing this rigorous evaluation methodology, the students' artistic growth and development were effectively measured, providing valuable insights and feedback to further enhance their design capabilities. The scale provides us with a

systematic approach to measure their artful thinking skills and helps us identify areas where further support and guidance may be needed.

Table 3. The Accessment of Research Result

Aspect	Criteria				Argument on the score
Cultural layer	**Obvious**			**Beyond the given**	
	1 Doesn't go beyond the given information	2	3	4 Explores beyond the obvious, find new applications, questions, and connections.	The student successfully incorporated three cultural layers and discovered new applications for Dayak culture's long ear tradition. Unfortunately, the student has not explored far enough. by choosing to design jewelry rather than other products that are very different to the original cultural object.
Design Scenario	**Fuzzy**			**Clear and focused**	
	1 Unfocused, disorganized, rambling. Misplaces ideas or goals.	2	3	4 Thinking is structured and has clear objectives. Well-organized around main ideas.	The student has successfully completed the thinking routine with clear objectives and is well organized. Mind mapping assists students in structuring their thinking processes.
Design exploration	**Simplistic**			**Elaborated**	
	1 Oversimplified, lack of detail, generalized, broad.	2	3	4 Rich in detail and nuanced	The design outcome is quite rich and nuanced, by having different designs on each pair of earrings
	One-dimensional			**Multidimensional**	
	1 Covers 1 topic lacks complexity, and other perspectives.	2	3	4 Touch different topics and has complexity and other perspectives.	The beauty theme is still very relevant today, but the perspective can be quite boring for quite some time
Integration of designers' aesthetic sense and cultural value	**Restricted**			**Generative**	

	1	2	3	4	
	Close-minded, biased, and not interested in big ideas or tough questions.			Open-minded, creates new lines of inquiry, and broadens understanding.	The student has achieved a remarkable accomplishment in developing a unique form of jewelry design that departs from conventional styles and stands out as innovative and fresh. The new designs showcase the student's creativity, ingenuity, and ability to think outside the box.
Cultural product design	**Missed the point**			**Essence-capturing**	
	1 Off topic and missed key themes, traits, or elements	2	3	4 Captures the essence and has depth. Identifies themes, traits, or elements.	The student successfully captured the essence of Dayak long ear tradition—that beauty comes from the process of enduring hardship—by creating a new form of earring design inspired by visceral, behavioral, and reflective design elements of ear lengthening Dayak culture.
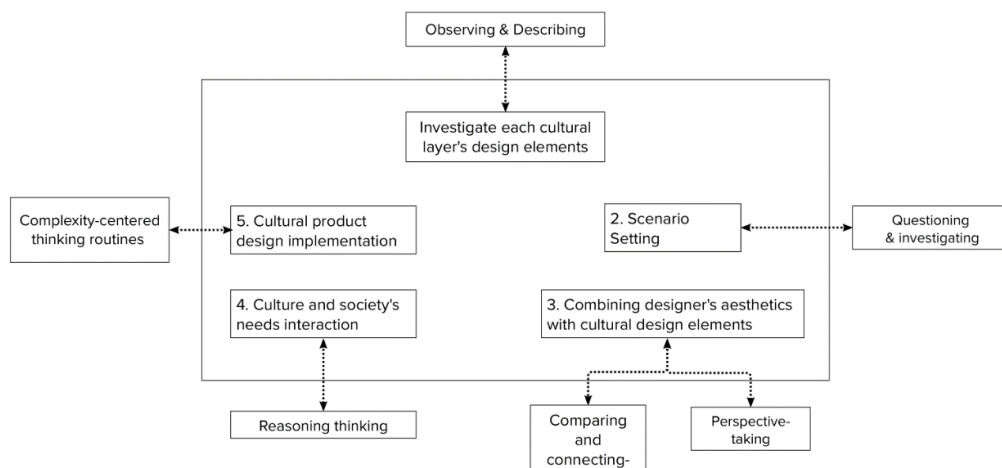
Figure 22. The Enhanced Cultural Product Design Framework with Artful Thinking Routines

From the design process, we conclude that it is quite successful that the student has managed to design new jewelry design that is unique and has strong meaning and purpose for society. From the experience of implementing artful thinking unto the cultural product design process, we propose a framework to help future designers do cultural product design through artful thinking approach.

5. Conclusion

From the findings, we conclude that artful thinking supports and enhances the cultural design process by guiding designers to go through a series of thinking routines that allow them to think more critically about the cultural design element on each cultural layer. The thinking routines allow designers to take the time to look beneath the surface and reflect cultural values deeply. Designers can use this process to create a more in-depth and meaningful innovative design inspired by culture. The answers to the research questions provide guidelines for designers on how to implement artful thinking to CPD design process.

1. Observing and describing thinking routines enrich the investigation stage of the cultural product design process because careful observation and seeing the artefacts slowly and repetitively are key during the investigation process to understand the distinction between the local culture and the other culture. By understanding the distinction, designers can find inspiration that is unique and only exists in that culture.

2. Questioning and investigating thinking routines enrich the investigation stage of the cultural product design process because asking the right questions can unlock new knowledge that we didn't even realize before. It spurs learning and exchange ideas between the old and the new. It fuels innovation. and building up into something useful. In the context of the case study, the designer questions and investigates the meaning of lengthening ears in Dayak culture. The designer discovers that the culture is on the verge of extinction because there is no modern way to preserve it, and modern people regard it as a cruel and primitive tradition.

3. Reasoning thinking routines enrich the interaction stage of the cultural product design process because by doing reasoning thinking designers can see the relation and create logical connection between past and present conditions. Seeing other cultures as reference also helps the reasoning thinking process.

4. Comparing and connecting-centered thinking routines enrich the development stage of the cultural product design process because by comparing and connecting different artefacts designer can see subtle differences or unexpected similarities. In addition, it helps designers to comprehend the complexity of the ideas behind the cultural objects.

5. Perspective-taking thinking routines enrich the development stage of the cultural product design process because in the development stage, through artful thinking routines, designers can mold their own perspective about the cultural values that capture the essence and have depth.

6. Complexity-centered thinking routines enrich the implementation stage of the cultural product design process because by using complex centered thinking, designers can discover how each culture of layer works in a system that can be split into parts or grouped into a whole. For instance, in Dayak culture the long

ear tradition is part of behavioral culture and the long ear tradition itself has material culture.

In addition, the study supports the use of the continua matrix of Tishman & Palmer, (2006). It helps designers to assess the quality of thinking throughout the cultural design process. They can also be used by designers themselves to examine a guide their own thinking.

Unfortunately, there are still points of concern during the design process. First, designers' lack of cultural awareness might blind their judgment. Some cultural elements may look new to the designers but might not to the others. The lack of designer's cultural experience may also limit the design exploration process. Second, the research is looking into new designs that are obviously related to traditional culture. Hence, we recommend future research should focus on developing the artful thinking routine to other categories of cultural product design.

Acknowledgement

References

Foreman, A. (2015). *Why Footbinding Persisted in China for a Millennium*. https://www.smithsonianmag.com/history/why-footbinding-persisted-china-millennium-180953971/

Gumulya, D., Meilani, F. (2022). Transformasi Budaya Lokal Menjadi Desain Produk Kontemporer Dengan Metode IMO. *SERENADE : Seminar on Research and Innovation of Art and Design*, *1*, 8–15. https://doi.org/10.21460/serenade.v1i1.6

Harvard. (2016). *See, Think, Wonder | Project Zero*. http://www.pz.harvard.edu/resources/see-think-wonder

Hsu, C., Lin, C., & Lin, R. (2011). *A Study of Framework and Process Development*. *March*. https://doi.org/10.1007/978-3-642-21660-2

Jali, N., Suknunan, S., & Bhana, A. (2021). Challenges impeding women into leadership roles in a student-led organization at a South African higher education institution. *Problems and Perspectives in Management*, *19*(4), 508–518. https://doi.org/10.21511/ppm.19(4).2021.41

Korzhov, N., Kovalenko, A. (2013). *Myanmar's neck ring women*. https://www.aljazeera.com/gallery/2013/9/17/myanmars-neck-ring-women

Lee, K.-P. (2004). Design Methods for Cross-Cultural Collaborative Design Project. *Futureground - DRS International Conference 2004*, 17–21.

Lin, R. T. (2007). Transforming Taiwan aboriginal cultural features into modern product design: A case study of a cross-cultural product design model. *International Journal of Design*, *1*(2), 45–53.

Lowe, G.M., Prout, P., & Murcia, K. (2013). I see, i think i wonder: An evaluation of journaling as a critical reflective practice tool for aiding teachers in challenging or confronting contexts. *Australian Journal of Teacher Education*, *38*(6), 1–16. https://doi.org/10.14221/ajte.2013v38n6.6

Mishhov, A. (2021). *Mursi Tribe – The Larger The Lip Plate, The Bigger The Bride Wealth*. https://www.documentarytube.com/articles/mursi-tribe-the-larger-the-lip-plate-the-bigger-the-bride-wealth

Norman, D. (2005). *Emotional Design: Why We Love (or Hate) Everyday Things*. Basic Books.

Nugraha, A. (2005). Transforming tradition for sustainability. *International Conference on Design*, 1–7.

Qin, Z., Song, Y., & Tian, Y. (2019). The impact of product design with Traditional Cultural Properties (TCPs) on consumer behavior through cultural perceptions: Evidence from the young Chinese generation. *Sustainability (Switzerland)*, *11*(2). https://doi.org/10.3390/su11020426

Tishman, S. (2017). *Slow looking : the art and practice of learning through observation*.

Tishman, S., Palmer, P. (2006). *Artful Thinking Stronger Thinking and Learning Through The Power of Art*.

Worldbank. (2021). *Indonesia | Data*. https://data.worldbank.org/country/ID

Zimmerman, J., & Forlizzi, J. (2014). Research through design in HCI. *Ways of Knowing in HCI*, 167–189. https://doi.org/10.1007/978-1-4939-0378-8_8/COVER