The Application of Handcrafted Hair Carving in Sustainable Development Concept: A Case Study of Optical Art Style in Hairstyling Design

Tuck-Fai Cheng[1,2]*, **Wei-Chih Hung[3]**, **Po-Hsien Lin[2]**, **Mo-Li Yeh[4]**, **Rungtai Lin[2]**

[1]Department of Applied Cosmetology, Hungkuang University, Taichung

[2]Graduate School of Creative Industry Design, National Taiwan University of Arts, New Taipei

[3]Department of Hair Styling and Design, Hungkuang University, Taichung

[4]Department of Cultural and Creative Design, Lunghwa University, Taoyuan

Email: *kenneth1831@hk.edu.tw, t0131@ntua.edu.tw, tony.19850302@gmail.com, 1101moli@gmail.com, rtlin@mail.ntua.edu.tw

Abstract

The advantage of using hairdressing products as hairstyle image design is to present the beauty of various shapes and color changes of dyed and permed hair. As to avoid the use of chemical agents or chemical hair products as a beautiful medium, the most primitive beautifying techniques-the performance of hand-carved hairstyles is a method in line with the concept of sustainable management concept. This article uses the method of literary analysis to explore sustainability, optical art, and men's hairstyle hand-carved. Based on empirical research, an evaluation of the characteristics of hand-curved hairstyling works developed using artisanal techniques that align with the sustainability concept. A questionnaire survey on five works (A, B, C, D, E) for Stylistic Expression (Technical Form) and Consumer Acceptance (Commercial Viability) is used to analyze the phenomena value of the works. As Work E scored the highest in the Stereoscopic Illusion (Q1) survey item, in addition to fitting the research theme of Optical Art Illusion, it also scored the highest in other features. The study shows that Work E is valued due to factors such as Beauty (Q2), Aesthetic Pleasure (Q4), Self-Personalize (Q6), etc., and suitable for sports occasions, gentlemanly characteristics on appearance, and feedback provided for industry reference.

Keywords

Optical Art, Hand-Carved, Hair Carving, Hairstyling Design, Sustainability

1. Introduction

Since ancient times, people have always enjoyed experimenting with their hair. The value of hair has long surpassed its mere function. In today's world, there is an abundance of hair products available, all aiming to enhance the beauty of hairstyles. Reports indicate that to create beautiful hairstyles, hair dye products can be used to achieve permanent hair color, with Para-phenylenediamine (PPD) being a common primary intermediate compound responsible for the color-changing effect. A trace contaminant, 4-aminobiphenyl (4-ABP), found in consumers' permanent hair dyes, is believed to be associated with the PPD component. Although the results of studies have shown no evidence that exposure to 4-ABP in consumer hair dyes increases the risk of cancer in humans, the potential carcinogenic risk from long-term use of permanent hair dyes and exposure to 4-ABP is a cause for concern (More et al., 2023). Some information on health risks indicates potential health risks associated with the use of hairstyles and chemical agents (Asbeck et al., 2022).

The hairdressing industry often promotes the use of natural plant-based active ingredients as a replacement for chemicals, not only for their benefits to human health but also for providing a sustainable lifestyle solution (Chen, 2019). However, there are few articles that showcase the beauty of pure handcrafted haircuts, where the hair length is controlled by a professional hair stylist using expert techniques, and where hand-curved designs create beautiful patterns that align with sustainable business practices and development.

By controlling and varying the length of hair carving, hand-curved hairstyling design showcases a diverse range of artistic patterns with depth and shadow, creating a unique style. The study of hand-curved hairstyling design not only aligns with the goals of sustainability development reflected in the SDGs but also allows for understanding public perception and aesthetic evaluation of the hair curving industry in contemporary fashion through questionnaire surveys and analysis. It reflects the practical value of its aesthetic form and consumer acceptance in various phenomena.

Besides choosing hair dye as a means to create a new image, other methods such as hand-carving patterns and styling are also eco-friendly and aesthetic options for beautification. An addition to providing sun protection, creating a visually appealing hairstyle is also an essential requirement. Recognizing the international emphasis on creative hair tattoo styles and their decorative effects, achieved through handcrafted designs without the use of any chemical hair products, hair tattoo has become a sustainable consumption choice for both individuals and the environment. The researchers used the Optical Art style as a position to explore the aesthetic expression of men's haircuts in hair tattoo style, as well as to study their practical aesthetics (Hung, 2022). Thus, the present study adopts an empirical research approach to understand phenomena through Optical Art style and hand-curved practical experiences. Through the analysis of objective data, aims to solve problems, verify hypotheses, and establish a syste-

matic theory. By utilizing empirical research methods, a questionnaire survey aims to contribute to the advancement of knowledge in the field (Jhou, 2012).

2. Materials and Methods

A report indicates that using hair styling products such as hair dye and perm products to achieve desired hair designs can pose a threat to water management crisis and water resource safety, especially for Taiwan, a small island with limited freshwater resources. As such, hand-curved hair styling industry without chemical hair dye is yet to be developed and promoted to avoid environmental pollution. Apart from using chemical hair dye and perm products, there are many ways to express beauty through hair design, such as handcrafted hair styling patterns and shapes that are environmentally friendly and aesthetically pleasing. Creating visually appealing hairstyles is also essential. Recognizing the international emphasis on creative hair styling and tattooing styles and their decorative effects, the use of handmade design without any chemical hair styling products can increase awareness of the current water resource crisis for SDGs 6 (Clean water and sanitation). Besides promoting SDGs 8 (Decent Work and Economic Growth), this initiative can also contribute to achieving SDGs 4 (Quality Education) by understanding "hair design culture" as a critical element in sustainable development.

Researchers focused on Optical Art style to explore the aesthetic expression of male hair styling in hair tattooing style, using competency-based curriculum and learning outcome assessments to promote practical aesthetics. Understanding the inherent value of education and analyzing and determining one's own learning needs in the personal development process is crucial. Additionally, to comprehend gender differences in the perception of hand-curved artwork, researchers used empirical research methods and information from questionnaire surveys as a reference to enhance the full participation of male and female perspectives in the appreciation of hair beauty, thereby achieving the SDGs 5 (Gender Equality) goal.

Through objective data analysis, traditional gender role concepts can be recognized in the concept while respecting cultural diversity and opposing all standardized forms of aesthetic perception. By using the research topic to explore artwork creation and practical research, the initiative aims to enhance and promote knowledge in the field of diverse gender backgrounds and apply learned knowledge to promote sustainable development in daily life. Attempting to form a neutral aesthetic hair styling trend in the Optical Art style, the initiative also seeks to construct a new empirical discussion process to resolve the opportunity of combining technical forms of art with commercial feasibility to promote cultural and creative industries, consider sustainable lifestyle, and promote diversified sustainable production and consumption practices, while also making life more aesthetic and aesthetic life as SDGs 12 (Responsible Consumption) goal.

2.1. Research Framework

This study aims to integrate three perspectives: SDGs, artisanal techniques on hair cutting, and optical art style through a literature review. Through a survey process and data analysis, the study seeks to construct new empirical discussions that address the technical forms and commercial viability of the artwork. Therefore, the structure of the work is designed to follow a framework that includes sample, programming, and presentation from designer, leading to the visible, comprehensible, and inspirational aspects for the consumers from the aesthetic pleasure evaluation framework based on transition from seeing to perceiving (Gao, 2022) (Table 1).

2.2. Sustainable Development Goals (SDGs)

SDGs refer to the 17 sustainable development goals established by the United Nations in 2015 with the aim of achieving global sustainable development by 2030. The full name of SDGs is "Sustainable Development Goals". The research topic aligns with SDGs 4 (Quality Education), SDGs 5 (Gender Equality), SDGs 6 (Clean Water and Sanitation), SDGs 8 (Decent Work and Economic Growth), and 12 (Responsible Consumption and Production). The figure below illustrates the five sustainable development foundations of the research topic, aligned with the SDGs goals.

Through Table 2, the five areas of consensus of the SDGs for Hand-Carved artworks are displayed. Specifically, the knowledge, attitude, and skill aspects are used to illustrate the corresponding improvements in technical practice for SDG 4 (Quality Education), the gender-free equality treatment of artworks for SDG 5 (Gender Equality), the reduction of resource overuse and pollution for SDG 6

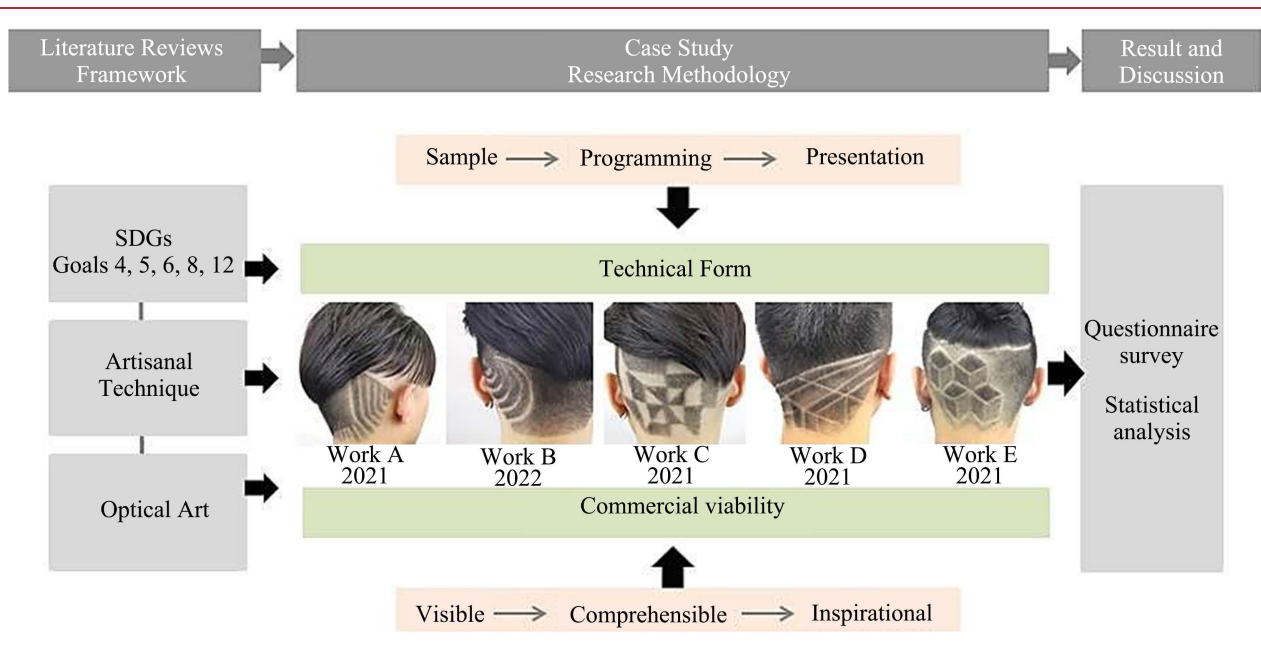**Table 1.** A research framework for hair-curved styling design.

Table 2. Hair-curved styling works related to the SDGs.

SUSTAINABLE DEVELOPMENT GOALS		→		Optical Art Hairstyling	HAND-CARVED
4 QUALITY EDUCATION	**Ensurement** Inclusive, equitable and quality educational learning opportunities	→	**Knowledge Aspect-**Cultural sustainable development reality **Attitude Aspect-**Personal skills improvement, employment and entrepreneurship **Skill Aspect-**Application of educational knowledge promotion and sustainable development	**Improvement** Self-practice through Optical Art research	
5 GENDER EQUALITY	**Achievement** Gender equality	→	**Knowledge Aspect-**Capabilities and skills are gender-neutral and ensure full participation **Attitude Aspect-**Opposition to gender discrimination, and enhancement of gender equality **Skill aspect-**The development of gender-neutral curriculum instruction	**Gender-Free** Beauty of patterns, techniques as objectives, gender-neutral style	
6 CLEAN WATER AND SANITATION	**Management** Sanitation and sustainable water resources	→	**Knowledge aspect-**Water resources security and sustainable water resources foundation **Attitude aspect-**Awareness of the water crisis **Skill aspect-**Daily water saving	**Pollution Reduction** Chemical hair products reduction, low resource overuse	
8 DECENT WORK AND ECONOMIC GROWTH	**Employment** Economic growth	→	**Knowledge aspect-**Professional market creation for environmental protection awareness **Attitude aspect-**Workers' resilience to the environment and the economy. **Skill aspect-**Development interpretation and evaluation for innovative societies, new technologies and local economic to promote sustainable development.	**Irreplaceable** Hairstyles patterns, the designer's creative technical hand-carved expression	
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	**Development** Consumption and nature awareness	→	**Knowledge aspect-**Recognize strategies and new institutions for sustainable production and consumption **Attitude aspect-**Raise awareness of the environment-related aspects of responsible consumerism. **Skill aspect-**Rethinking sustainable lifestyles, production and consumption practices	**Sustainability** Hand-carved hair industry, a sustainable lifestyle	

(Clean Water and Sanitation), the sustainable and irreplaceable nature of creative artworks for SDG 8 (Decent Work and Economic Growth), and the promotion of a sustainable lifestyle for the Hand-carved hair industry in accordance with SDG 12 (Responsible Consumption and Production). Given that the hand-carved industry aligns with sustainable development goals, it merits promotion. This industry not only provides economic and social benefits but also plays an active role in reducing resource waste and environmental pollution. Promoting this industry can significantly contribute to promoting sustainable development and achieving SDGs (UNESCO, 2023).

In order to correspond to the SDGs goals, chart of Table 2 explains the relevant considerations related to the sustainable development of the hand-carved hairstyle industry from the aspects of knowledge, attitude, and technology. In line with SDG4 (Quality Education), this article advocates for a pattern aesthetic direction of "self-practice through Optical Art research" to achieve improvement. The SDGs (Gender-Free) oriented towards work aesthetics can create a gender-neutral fashion aesthetic by focusing on the beauty of patterns and techniques as objectives. As the patterns of hand-carved hairstyles are expressed through artisanal implementation and formed naturally without the use of any chemical dyes, it achieves the SDGs 6 (Pollution Reduction). Due to the uniqueness of hand-carved hairstyle creations, which cannot be replicated, it forms an irreplaceable form of profession, contributing to SDGs 8 (Decent Work and Economic Growth) by promoting industry innovation or expanding the hairdressing industry in new directions for references.

In conclusion, the relationship between the SDGs and the hand-curved hair industry can be summarized as follows:

SDG 4: Promoting quality education in hand-curved styling design can cultivate skilled workforce and provide opportunities for vocational training and professional development in the hairdressing industry, equipping individuals with the knowledge and skills required for the profession.

SDG 5: Promoting gender equality is essential to ensure equal opportunities for all professions, including the hand-curved industry, and to promote equal representation and participation of all genders in various fields, including the beauty and hair industry.

SDG 6: While the direct connection between the hand-curved industry and SDG 6 may not be evident, SDG 6 emphasizes the reduction of water pollution to maintain the cleanliness of water sources and sanitation facilities, which is crucial for sustainable development and overall health and hygiene. The hand-curved hair industry can contribute by reducing the use of chemical products that may pollute water sources.

SDG 8: The hand-curved hair industry, being predominantly a manual process, promotes the demand for personal services and stimulates job opportunities and entrepreneurial spirit, contributing to decent work and economic growth. These align with the principles of SDG 8.

SDG 12: While hand-curved hair styling itself may not directly impact responsible consumption and nature awareness, salons and professionals can adopt sustainable concepts and practices in their operations. This includes promoting hand-curved styling as a sustainable hair styling option and reducing the use of chemical hair products, raising awareness among clients about hair care and sustainable practices.

2.3. Hair-Curved Artisanal Technique

The expression of beauty in hair design can take many forms. In addition to choosing dyeing and perming as means to create a new image, handcrafted hair carving patterns and styles are also a sustainable and aesthetic choice. Creating a visually appealing hair style is also an essential requirement. Recognizing the international emphasis on the creative hair tattoo style and its decorative effects, it can be achieved through handcrafted design without using any chemical hair products, thereby raising awareness of the current water resource crisis. This paragraph mainly explains the steps involved in the design and production of hand-crafted hair carving. The process begins with setting the composition of the hair carved area, followed by using a professional hair-cutting tool with an adjustable blade to create variations in length between 6 mm and 3 mm. This produces a three-dimensional visual effect through the use of light and shadow. The overall hair style is repeatedly reviewed to ensure that there is no need for detailed modification, and the final result is captured through photography for subsequent questionnaire survey. The chart below illustrates the creative process of the hair design work by Wei-Chih Hung, one of the authors of this paper and also a hair stylist (Table 3).

2.4. Five Optical Art Hair-Carving Works Requirements for the Research Project

This study explores the aesthetics and applications of five hand-carving styles that demonstrate different technical expressions. The objective is to identify the most widely accepted or preferred works and analyze their characteristics to clarify their value. This information can serve as a reference for the industry to evaluate and develop sustainable hair-carving practices. Hair carving technique mainly uses hair length as a means to express light and shadow, creating a stereoscopic illusion. The figure illustrates the effectiveness of hair carving when hair length ranges from 3 mm to 6 mm (Table 4).

2.4.1. Optical Art
It was also known as "Op Art" (Optical Art), light effect art, optical illusion art or retinal art, using optical technology to create bizarre artistic effects (Table 4). The content of works was usually a periodic combination or special arrangement of lines, shapes, and colors. The artists used the interlacing of vertical lines, horizontal lines, and curves, as well as the juxtaposition of circles, arcs, and rectangles to cause visual illusions for viewers or appreciators. These illusions

Table 3. The execution steps and related details of hair-curved styling.

Step	flowchart	Hair-Curved Procedure
1		• Set the composition of the hair carving area, divide it into sections and fix it with hair clips. • Use an electric hair clipper and set it to 6 MM using the guard. • Start by trimming to the fixed length in the hair carving area. • Be careful of the hairline boundary between the upper and lower sections to avoid accidentally cutting the longer hair on top.
2		• Use a small electric trimmer to modify the hairline and make it neat and clean. • Adjust the visual coordination of the hair carving area. • Adjust the position according to the size of the model's hairline to showcase the beauty of the hairline and neck.
3		• Apply aloe vera gel or lotion to the scalp to reduce itching and discomfort when shaving the scalp with a razor. • Use a razor to clean and adjust the hairline. • During the hairline shaving process, the technician should slow down. Their breathing to help stabilize their hands and reduce shaking.
4		• Use a professional adjustable blade hair clipper with attachments (such as 6 mm, 3 mm) to create variations in hair length and produce a sketch-like effect with depth and shadows. • Completed a three-dimensional optical illusion Op Art style pattern hair carving.
5		• Check the completed hair carving pattern for any details that may need to be adjusted or refined to enhance the overall look.
6		• Overall head styling and photography operations.
7		• Display of creative results

Table 4. The effect of layering hair by using hair cutting tools.

| 3 mm hair length | 6 mm hair length | 3 mm distinct hairlines | 6 mm distinct hairlines |

include the flat pattern of three-dimensional or unusual visual effects. Below is one form and expression of the optical art effect of stereoscopic illusion (He, 1991).

Via the geometric based on the arrangement of patterns of three-dimensional modeling principles, the creation of hair engraving techniques achieves a magic-like visual illusion. Above **Figure 1** shows one of Optical Artist Victor Vasarely's works, in which he creates geometric patterns in two-dimensional space
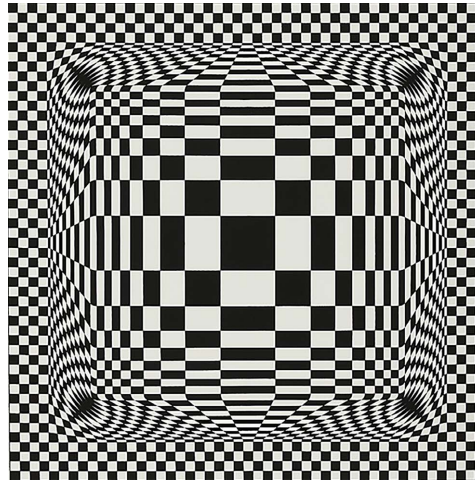
Figure 1. Optical art "nora-dell" of victor Vasarely (1906-1997), 1974.

that produce an illusion of depth perception between the second and third dimensions, resulting in a three-dimensional illusion with depth. (Figure 1)

2.4.2. Five Optical Art Hair-Carving Works as Case Studies for Analysis

Five hand-curved artworks created in the Op Art style between 2021 and 2022 were used as case studies for this survey. The selection criteria were based on the visual forms of straight lines, single lines, squares, triangles, and blocks, with an attempt to provide the public with a perception and understanding of the differences in aesthetic appreciation and practical applications of the artworks based on their distinctive visual forms (Table 5).

2.5. Design of Questionnaire Survey Method

The research topic is divided into two parts: Stylistic Expression and Consumer Acceptance. The former mainly focuses on the technical form, while the latter clarifies the commercial viability (Table 6). The Stylistic Expression dimension mainly discusses the formal aesthetic content of the works: Stereoscopic Illusion (Q1), Beauty (Q2), Technical Innovation (Q3), Self-Personalize (Q6), Formal Imagery (Q8) (Ocvirk et al., 1997) and Works Feeling (Q10). The Consumer Acceptance Dimension mainly discusses the application aspects of the works: Aesthetic Pleasure (Q4), Preference (Q5), Spend Willingness (Q7), Style Suitability (Q9), Occasion Choice (Q11), and Consumer Age (Q12), from the perspective of consumers (Table 7).

Table 8 shows that a survey of 116 people was conducted, consisting of 74 women and 42 men. Based on the statistical results of the survey, a comprehensive analysis was carried out on five hair-curved works (Work A, B, C, D, E) by gender, professional background (Salon Beauty, Art Design, General Category), experience or without hairdressing techniques, and age (21 - 30, 31 - 40, over 41), and the best-performing work of E demonstrates that Figure 2 is selected for further analysis and shows the best overall performance. It is therefore chosen for in-depth analysis in the results section to explore the value of the work.

Table 5. Five optical art works for exploration practical value (By designer Wei-Chih Hung).

| Work A 2021 | Work B 2022 | Work C 2021 | Work D 2021 | Work E 2021 |

Table 6. The two major directions of the questionnaire survey for five works-stylistic expression and consumer acceptance.

- **Stylistic Expression**
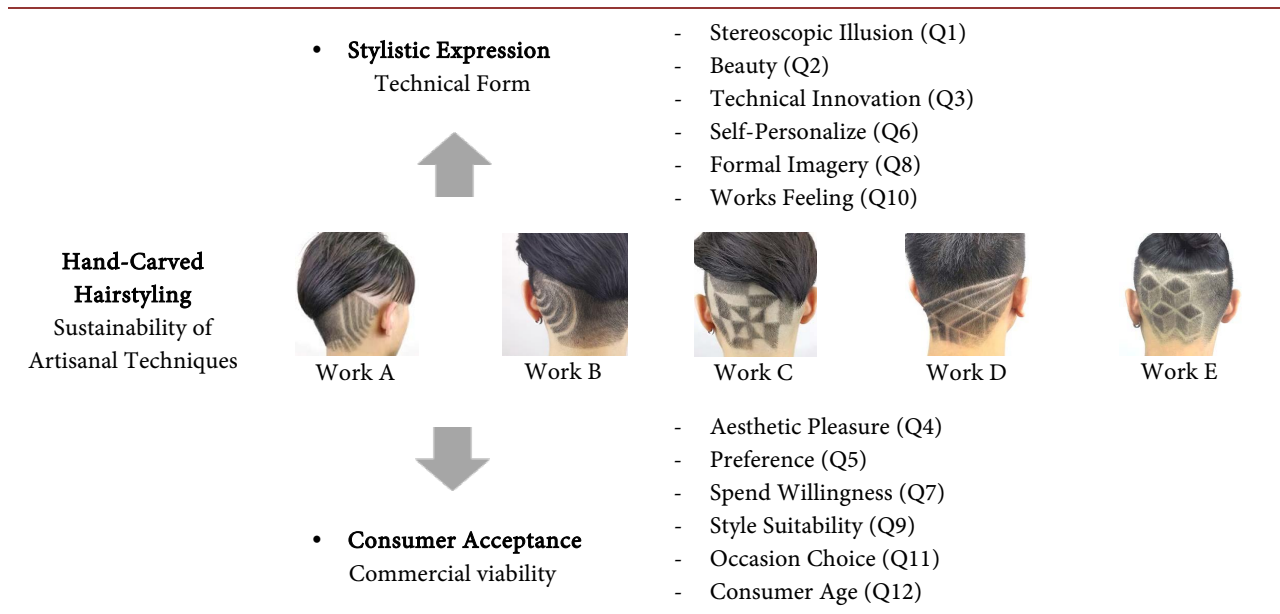 Technical Form

  - Stereoscopic Illusion (Q1)
  - Beauty (Q2)
  - Technical Innovation (Q3)
  - Self-Personalize (Q6)
  - Formal Imagery (Q8)
  - Works Feeling (Q10)

Hand-Carved Hairstyling
Sustainability of Artisanal Techniques

| Work A | Work B | Work C | Work D | Work E |

- **Consumer Acceptance**
  Commercial viability

  - Aesthetic Pleasure (Q4)
  - Preference (Q5)
  - Spend Willingness (Q7)
  - Style Suitability (Q9)
  - Occasion Choice (Q11)
  - Consumer Age (Q12)

Table 7. The question stem and answer options of the questionnaire survey.

question	Question Headings	Answer Options	Attributes
Q1	Stereoscopic Illusion	Likert 5 Point Scale	Stylistic Expression
Q2	Beauty	Likert 5 Point Scale	Stylistic Expression
Q3	Technical Innovation	Likert 5 Point Scale	Consumer Acceptance
Q4	Aesthetic Pleasure	Likert 5 Point Scale	Consumer Acceptance
Q5	Preference	Likert 5 Point Scale	Consumer Acceptance
Q6	Self-Personalize	Likert 5 Point Scale	Stylistic Expression
Q7	Spend Willingness	Likert 5 Point Scale	Consumer Acceptance
Q8	Formal Imagery	<u>Multiple Selection:</u> sunken, undulation, vibration, glittering, whirling, bulging, deformation, distortion, graduation, other	Stylistic Expression
Q9	Style Suitability	<u>Multiple Selection:</u> child, sports, gentleman, teenager, commercial, art form, other	Consumer Acceptance
Q10	Works Feeling	<u>Multiple Selection:</u> passion, calm, confidence, ingenuous, rebellious, swag, interesting, elegant, crazy, decadent, other	Stylistic Expression

Continued

Q11	Occasion Choice	Multiple Selection: party, sports, fashion ball, daily, specific totems, spur moment, job requirement, other	Consumer Acceptance
Q12	Consumer Age	Multiple Selection: pre-school, primary school, junior high school, senior high school, college student, adult 1, adult 2, adult 3, adult 4, other	Consumer Acceptance

Table 8. The basic information for questionnaire analysis N = 116.

Gender	Professional background	Hairdressing experience	Age
Female (74)	Salon Beauty (39)	Yes (55)	21 - 30 (41)
Male (42)	Art Design (38)	No (61)	31 - 40 (20)
	General Category (39)		Over 41 (55)

Figure 2. Work E is the most prominently featured piece among the five works.

3. Results

Based on the scores of the different questions, it can be inferred that each work has its own unique characteristics and strengths. Further analysis can be conducted to gain a deeper understanding of each work and its artistic qualities. Table 2 shows that Work E had the highest score in the stereoscopic illusion (4.46, Q1) questionnaire and also fits the research theme of optical art effect. Moreover, it received the highest scores for Q2, Q3, Q4, Q5, and Q7 (Q6 as the second highest) of the five works. It is necessary to conduct further analysis and value judgment on the phenomena observed in Work E. In addition to it, Work C is the second most prominently featured piece among the five works. In terms of scores from Q1 to Q7, only Q6 received a higher score than Work E. Therefore, a further analysis will be conducted using the Work E (Table 9).

Table 9. The ranking of work A to E based on stereoscopic illusion effect (Q1).

Ranking	1	2	3	4	5
Works					
	E	C	D	A	B
Average	4.46	4.07	3.57	3.52	3.45

3.1. Regarding the Fit with the Research Theme-Stereoscopic Illusion (Q1) for Work E

Table 10 shows that Work E had excellent performance in Q1, Q2, Q3, Q4, Q5, and Q7, while Work C had the highest score in the Self-personalize (Q6) option.

3.2. Top Three Ranking of Q1 - Q7 for Work E

The top three were Stereoscopic Illusion (4.46, Q1), Technical Innovation (4.31, Q3), and Self-Personalize (4.24, Q6), while Spend Willingness (3.25, Q7) ranked the last (Table 11).

3.3. The Formal Imagery (Q8) Characteristics of Work E

The option of Whirling [9] (77.6%) stands out as a distinctive characteristic with a large difference compared to the second-highest scorer, occupying 90 out of 116 respondents (Table 12).

3.4. The Style Suitability (Q9) Characteristics of Work E

The option of Gentlemen (62.9%) stands out as a distinctive characteristic with a large difference compared to the second-highest scorer, occupying 73 out of 116 respondents (Table 13).

3.5. The Works Feeling (Q10) Characteristics of Work E

The difference between the top three options is not significant. They are Calm (38.8%), Swag (37.9%) and Confidence (36.2%). Apparently, there is not much consensus on this question (Table 14).

3.6. The Occasion Choice (Q11) Characteristics of Work E

The option of Athletic Competition (47.4%) stands out as a distinctive characteristic occupying 55 out of 116 respondents. Fashion Ball (39.4%) may be the second appropriate option for the occasion (Table 15).

3.7. The Consumer Age (Q12) Characteristics of Work E

Based on the statistical table, it can be inferred that Work E is suitable for the consumer group of primary school students, and it also indicates that it is less suitable for elderly age groups (Table 16).

Table 10. The mean scores of Q1 - Q7 for five works N = 116.

Question	Work A	Work B	Work C	Work D	Work E
Q1	3.52	3.45	4.07	3.57	4.46
Q2	3.53	3.53	3.45	3.55	3.76
Q3	3.81	3.72	4.02	3.65	4.31
Q4	3.44	3.57	3.34	3.52	3.80
Q5	3.35	3.36	3.25	3.31	3.56
Q6	4.15	3.88	4.28	3.88	4.24
Q7	2.96	3.09	2.99	3.13	3.45

Table 11. The Ranking Degree of Q1 - Q7 in descending order for Work E N = 116.

Ranking	1	2	3	4	5	6	7
Question	Q1	Q3	Q6	Q4	Q2	Q5	Q7
Mean scores	4.46	4.31	4.24	3.80	3.76	3.56	3.45
SD	1.0664	1.1144	1.1693	1.3136	1.3096	1.3596	1.4040

Table 12. The ranking of Q8 (formal imagery) for work E N = 116.

Ranking	1	2	3	4	5	6	7	8	9	10
option	whirling	Glittering	Distortion	Gradation	Deformation	Sunken	Undulation	Bulging	Vibration	Other
Respondent	90	39	21	19	13	9	8	8	6	1
Percentage	77.6%	33.6%	18.1%	16.4%	11.2%	7.6%	6.9%	6.9%	5.2%	0.7%

Table 13. The ranking of Q9 (style suitability) for work E N = 116.

Ranking	1	2	3	4	5	6	6
Option	Gentlemen	Sports	Child	Art Style	Teenager	Commercial	other
Respondent	73	16	11	7	5	2	2
Percentage	62.9%	13.8%	9.5%	6%	4.3%	1.7%	1.7%

Table 14. The ranking of Q10 (works feeling) for work E N = 116.

Ranking	1	2	3	4	5	6	7	8	9	10	11	12
Option	Calm	Swag	Confidence	Elegant	Active	Crazy	Passion	Rebellious	Decadent	Interesting	Ingenious	Other
Respondent	45	44	42	32	29	28	17	10	10	5	3	1
Percentage	38.8%	37.9%	36.2%	27.6%	25%	24.1%	14.7%	8.6%	8.6%	4.3%	2.6%	0.9%

Table 15. The ranking of Q11 (Occasion choice) for work E N = 116.

Ranking	1	2	3	4	5	6	7	8
Option	Athletic Competition	Fashion Ball	Party	Impromptu Decision	Daily	Job Requirement	Specific Occasion	Other
Respondent	55	44	29	28	28	17	15	0
Percentage	47.4%	37.9%	25%	24.1%	24.1%	14.7%	12.9%	0%

Table 16. The ranking of Q12 (consumer age) for work E N = 116.

Ranking	1	2	3	4	5	5	7	8	9	10	11	12
Option	primary school (H)	primary school (M)	Pre-school	primary school (L)	Senior high school	Junior high school	college student	adult 2 31 - 40	adult1 21 - 30	adult 3 41 - 50	adult 4 51 - 60	other
Respondent	82	59	38	33	17	17	14	13	11	8	3	0
Percentage	70.7%	50.8%	32.8%	28.4%	14.7%	14.7%	12%	11.2%	9.5%	6.9%	2.6%	0%

4. Discussion

This section aims to discuss phenomena from different directions, including Gender, Professional background (salon beauty, art design, general category), Experience with or without hairdressing techniques, and Age (21 - 30, 31 - 40, over 41). The analysis will include variation analysis of age, T-test of gender, T-test of experience, multiple regression analyses for Q5 (preference) and Q7 (spend willingness) for Work E, and a summary of reliability analysis on Work E to provide an overview of the characteristics of the work.

4.1. Variation Analysis for Three Groups of Age

It showed no significant differences for the three groups (21 - 30, 31 - 40, over 41) of questionnaire survey test (Table 17).

4.2. T Test of the Effect Gender for Work E

Gender differences are slightly different for Q1 - Q7. In other words, the average score of female was generally higher than the average score of male but not up to par (Table 18).

4.3. T-Test of Effect Experience for Work E

Individuals with experience in rational hair cutting tend to score higher than those without such experience. This may indicate that individuals with experience in rational hair cutting perceive a certain level of difficulty in this operation, while also illustrating difference in aesthetic perception related to the Optical Art style (Table 19).

4.4. Multiple Regression Analysis on Preference (Q5) for Work E

Regarding the multiple regression analysis for Work E in Q5, the overall regression model has an F value of 89.593 ($p < 0.001$), indicating a significant correlation between the independent and dependent variables. The multiple correlation coefficient is 0.896, and the explanatory power of the Q5 dimension for Work E is 80.3%. The standard regression coefficients (β values) are 4.729 and 3.798, which are significant (t = 4.729 and 3.798, $p < 0.001$), demonstrating that the Q5 dimension has the highest predictive ability for Work E. It could be seen in Table 12, if one enjoys (preference) Work E, they may also unknowingly give high scores to the other items (Q2, Q4, Q6) (Table 20).

Table 17. Variation analysis of age for work E (Anova) N = 116.

	Source of Variation	SS	Df	Ms	F	Scheffe method
	Between Groups	0.798	2	0.938	0.346	
Q1	Within Groups	129.988	113	1.150		
	Total	130.784	115			
	Between Groups	1.543	2	0.771	0.445	
Q2	Within Groups	195.699	113	1.732		
	Total	197.241	115			
	Between Groups	0.573	2	0.286	0.228	
Q3	Within Groups	142.255	113	1.259		
	Total	142.828	115			
	Between Groups	0.273	2	0.137	0.078	
Q4	Within Groups	142.255	113	1.754		
	Total	142.828	115			
	Between Groups	0.928	2	0.464	0.248	
Q5	Within Groups	211.649	113	1.873		
	Total	211.578	115			
	Between Groups	1.632	2	0.816	0.593	
Q6	Within Groups	155.609	113	1.377		
	Total	157.241	115			
	Between Groups	6.640	2	3.320	1.705	
Q7	Within Groups	220.049	113	1.947		
	Total	226.690	115			

Table 18. T-test of gender for work E N = 116.

Variable	item	N	M	SD	t
	Female	74			
	Male	42			
	Q1	74	4.51	1.0500	0.758
		42	4.36	1.1004	0.748
	Q2	74	3.92	1.3068	1.919
		42	3.45	1.2726	1.934
Gender	Q3	74	4.37	1.1536	0.698
		42	4.21	1.0485	0.717
	Q4	74	3.91	1.3422	1.279
		42	3.60	1.2506	1.304

Continued

Q5	74	3.68	1.3859	1.215
	42	3.36	1.3033	1.236
Q6	74	4.32	1.0993	1.014
	42	4.10	1.2842	0.972
Q7	74	3.54	1.4257	0.939
	42	3.29	1.3666	0.950

Table 19. T-test of experience for work E N = 116.

Variable	item	N	M	SD	t
	Inexperienced	61			
	Experienced	55			
	Q1	61	4.213	1.2795	−2.661
		55	4.727	0.6972	−2.739
	Q2	61	3.262	1.3893	−4.672
		55	4.309	0.9598	−4.759
	Q3	61	4.000	1.3038	−3.291
		55	4.655	0.7257	−3.383
Experience	Q4	61	3.295	1.3946	−4.771
		55	4.364	0.9499	−4.863
	Q5	61	3.115	1.3916	−3.946
		55	4.055	1.1453	−3.986
	Q6	61	3.951	1.3592	−2.908
		55	4.564	0.8111	−2.981
	Q7	61	2.918	1.4410	−4.652
		55	4.036	1.1049	−4.716

Table 20. Multiple regression analyses with fundamental relations as the dependent variable Q5 (Preference) for work E N = 116.

Dependent Variable	Independent Variable	B	SE	β	t
	Q1	−0.070	0.094	0.055	−0.748
	Q2	0.366	0.107	0.352	3.416**
Work E	Q3	−0.011	0.098	0.009	−0.107
	Q4	0.477	0.101	0.461	4.729***
	Q6	0.263	0.069	0.227	3.798***
	R = 0.896		R2 = 0.803		F = 89.593***

$**p < 0.01$, $***p < 0.001$.

4.5. Multiple Regression Analysis on Spend Willingness (Q7) for Work E

Regarding the multiple regression analysis for Work E in Q7, the overall regression model has an F value of 46.177 ($p < 0.001$), indicating a significant correlation between the independent and dependent variables. The multiple correlation coefficient is 0.823, and the explanatory power of the Q7 dimension for Work E is 67.7%. The standard regression coefficient (β value) is 4.400, which is significant (t = 4.400, $p < 0.001$), demonstrating that the Q7 dimension has the highest predictive ability for Work E. The premise for spending money is primarily based on the enjoyment of Aesthetic Pleasure (Q4), followed by consideration of Beauty appeal (Q2) (Table 21).

4.6. Summary for Reliability Analysis on Work E

From this reliability analysis, the whole scale of Work E values were 0.940 and α deletion of 9 items (Q1 - Q7) in lower than 0.940, which showed the reliability. For the overall reliability analysis, the Cronbach α and the average value from Q1 - Q7 were all together greater than 0.6. Therefore, this reliability analysis was reliability predictive (Table 22).

Table 21. Multiple regression analyses with fundamental relations as the dependent variable Q7 (Spend willingness) for work E N = 116.

Dependent Variable	Independent Variable	B	SE	β	t
Work E	Q1	−0.029	0.124	−0.022	−0.230
	Q2	0.305	0.142	0.284	2.155*
	Q3	−0.127	0.130	−0.100	−0.973
	Q4	0.586	0.133	0.584	4.400***
	Q6	0.187	0.092	0.156	2.044*
R = 0.823			R2 = 0.677		F = 46.177***

*$p < 0.05$, ***$p < 0.001$.

Table 22. Summary for reliability analysis on work E N = 116.

subscale	item	α if item deleted	α
Work E	Q1	0.720	
	Q2	0.880	
	Q3	0.793	
	Q4	0.881	0.939
	Q5	0.882	
	Q6	0.675	
	Q7	0.792	
Whole scale			0.940

5. Conclusion

The final conclusion of this article is that the Stylistic Expression of work from the Technical Form perspective (Q1, Q2, Q3, Q6, Q8, Q10) and its commercial viability (Q4, Q5, Q7, Q9, Q11, Q12) in terms of Consumer Acceptance are crucial aspects to consider as below.

5.1. On the Stylistic Expression Aspect

In terms of the overall assessment using a Likert 5-point scale across Q1 to Q7 options, the lowest score among the five works (Work A, B, C, D, E) was recorded for Work D in Q7-Spend Willingness (3.13), indicating that its aesthetic style is less popular among the general public. On the other hand, the highest score was obtained by Work E in Q1 (4.46). Work E also received the highest number of votes across Q1, Q2, Q3, Q4, Q6, and Q7 options, even though its score in Q7 was only 3.45. Additionally, for each individual work's highest score across Q1 to Q7 items, Work A, B, C, and D all scored highest in Q6-Self-Personalize (4.14, 3.88, 4.28, 3.88), while Work E ranked the second (4.24).

The characteristics of Work E showed that the Whirling option in Q8-Formal Imagery has the highest ratio (77.6%). In Q9-Style Suitability, Gentleman (62.9%) was the highest-rated option. For Q10-Works Feeling, there was a divided consensus, with Calm (38.8%), Swag (37.9%), and Confidence (36.2%) being the top three options. Q11-Occasion Choice suggests that the piece is suitable for Athletic Competition (47.5%) and Fashion Ball (37.9%) atmospheres. The target age group for consumers is primary school age (70%).

5.2. On the Consumer Acceptance Aspect

Regarding the Spending Willingness (Q7), the scores for the five works range from 2.96 to 3.45, indicating that a generally low willingness to spend on works with this style.

In the case of Work E, its Multiple Regression Analyses with Fundamental Relations as the Dependent Variable Q7 (Spend willingness) revealed that the primary basis for spending money is the enjoyment of Aesthetic Pleasure (Q4), followed by consideration of Beauty appeal (Q2). If someone prefers (Q5) Work E, they may also unknowingly give high scores to the other items (Q2, Q4, Q6). Individuals with experience in rational hair cutting tend to score higher than those without such experience. Female scores were generally higher than the average score of male. Variation Analysis for Three Groups of Age (21 - 30, 31 - 40, over 41) showed no significant differences.

In conclusion, it can be seen that the high scores given by the public based on their preference (Q5) for the works and the Stereoscopic illusion effect (Q1) of the works are in line with the research theme and have achieved the promotion of aesthetic education.

Additionally, it promotes the concept of environmental protection. Unfortunately, despite these positive aspects, the public's willingness to spend on hair

carving is not high, and further investigation and understanding are required to determine the reasons for this. As a conclusion drawn from the stage-based research, it is necessary to establish a schematic diagram (Table 1) of the research model as a basis for future reference in the academic community. This is an empirical research-based article, not only is the concept of environmental sustainability important, but also the exploration of the characteristics of Qualia (Yen et al., 2014) in work is worthwhile in the future, according to the survey results data displayed by the questionnaire, the four cycles of which are evaluation, feedback, reflection, modification that provide repeated verification of the developed themes and feedback provided for industry reference.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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