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Charm Factors of Clay and Composite Materials in Aesthetic Education Curriculum †

Qiu-Ying Lu [1] and Chia-Hui Huang [2,*]

[1] Institute of Arts and Crafts, Tung-fang Design University, Kaohsiung 82941, Taiwan; luqiuying1976@gmail.com
[2] Institute of Cultural and Creative Design, Tung-fang Design University, Kaohsiung 82941, Taiwan
* Correspondence: judy.tf.edu.tw@gmail.com
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Abstract: The significance of aesthetic education is increasingly acknowledged for its role in enhancing students' motivation for creativity, aesthetic sensibility, critical thinking, and imagination. This enhancement enriches the practice of art education, providing students with expansive learning experiences. Focusing on the use of clay and composite materials in aesthetic education, we analyzed how the curriculum and creative courses can increase the attractiveness of learning. The incorporation of clay and composite materials into the presentation of athletic figures affected students' artistic endeavors. The diversity of the course content and artistic skills are important factors in augmenting creative activities. Hence, educators need to consider such attributes in the development and execution of curricula in aesthetic education and stimulate students' artistic innovation and potential. The results of this study suggest a way to improve aesthetic education and composite material creation courses to elevate students' creativity and artistic competencies.

Keywords: aesthetic education; curriculum design; charm factors; Kano model

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1. Introduction

We examined Taiwan's aesthetic education development plan to enhance children's artistic literacy and creativity by teaching the courses "Aesthetic Education from Early Childhood to Lifelong Learning" and "Aesthetics as a Lifestyle." With limited school resources, extracurricular art classes using clay and composite materials have fostered artistic skills and the emotional expression of students. Focusing on consumers' needs and satisfaction with clay and composite materials, material selection and course quality were examined in aesthetic education. The importance of course design to CS and preferences was explored using the Kano model. The intricate relationship between motivations and satisfaction levels was also explored to address the complexities of aesthetic education. Through the analysis, we identified a way to boost CS. The results helped to offer recommendations for clay-based aesthetic education courses in terms of goal setting and decision making. The results also contribute to enhancing educational practices in aesthetic education using clay and composite materials to align with changing consumer expectations. Educators and curriculum designers need to adapt the results to evolve with demands in aesthetic education, highlighting the importance of a responsive approach.

2. Literature Review

2.1. Aesthetic Education Curriculum

The increasing emphasis on aesthetic education is evident. Research at Donghai Elementary School on sixth graders showed the success of interdisciplinary approaches in aesthetic education, utilizing scaffolding theory, cooperative learning, and creative thinking, enhanced by technology and color exploration [1]. Another study demonstrated

how physical education integrated athletics and aesthetics to increase confidence and aesthetic appreciation [2]. Advancements in early childhood teaching include teaching aesthetic principles to enrich art comprehension and appreciation in young children [3].

The application of aesthetic education principles was researched for creating engaging and creative courses [4]. The use of clay and composite materials in aesthetic education increased adaptability, sensory experiences, and aesthetic appreciation in children [5]. Children used composite materials for creative expression [6]. The significance of composite materials in children's visual arts was also proved in Ref. [7]. For upper elementary students' aesthetic perception and art appreciation skills, the importance of aesthetic education was highlighted [8]. By integrating aesthetic concepts into curriculum design, children's awareness and appreciation of the aesthetics of clay and composite materials can be added to aesthetic education.

2.2. Kansei Engineering

Kansei Engineering, initiated in 1991 by Masato Ujigawa and later integrated into the Japan Society of Kansei Engineering in 1998, focuses on creating products and spaces with attractive qualities. To study consumer senses and perceptions and to identify unique product characteristics, the Evaluation Grid Method (EGM) is used for user interviews and comparative analyses [9]. Recent advancements in Kansei Engineering have led to various designs that transform and quantify human perceptions and feelings towards objects, making product design more attuned to consumer emotional expectations [10]. The need for market-oriented design is emphasized in new product development by integrating consumers' aesthetics and individual needs to create appealing products [11]. In aesthetic education, clay and composite materials are not just creative mediums, but connectors between aesthetic literacy and emotional expression. This study suggests that by integrating the creative process with consumer psychology and principles of aesthetic education, its value and future development potential can be better understood within the context of aesthetic education.

2.3. Research Methodology: Application of the Kano Model

The Kano model plays a pivotal role in how consumers evaluate product quality, focusing on identifying product standards or features that significantly enhance satisfaction [12]. A bidirectional model was proposed, elucidating the multifaceted relationships between customer satisfaction (CS) and product feature performance [13]. This model classifies product features into five distinct categories, with each category exhibiting unique dynamics in affecting CS, as illustrated in Figure 1.

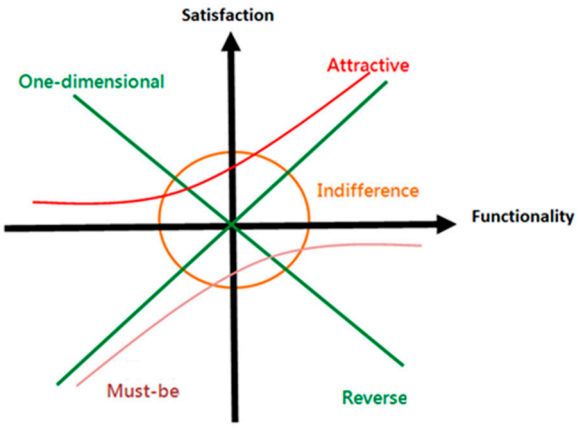

Figure 1. Kano model of CS.

The Kano model is used to classify customer requirements to understand its effectiveness in product needs [14]. It enables designers to make informed strategic decisions in product development. Investing in basic quality aspects may not be as beneficial as

enhancing attributes or features, which influence CS and quality perception. The model proves useful in scenarios with limited resources, where all product features cannot be improved. It helps identify features that impact CS and importance, guiding optimal product development strategies. In this study, the Kano model was applied to aesthetic education in a curriculum design involving clay and composite materials. The research framework was identified and categorized according to the learner's needs, helping educators understand which aspects effectively enhance learner satisfaction and engagement. The Kano model distinguishes essential elements (basic needs), appealing aspects (motivators), and elements that, while not crucial, significantly improve the learning experience (performance needs). The use of clay and composite materials in aesthetic courses, for instance, is a motivator, offering unique sensory and creative experiences that increase learner satisfaction and course engagement. The Kano model in aesthetic education curricula with clay and composite materials allows for aligning closely with learner expectations, enhancing educational effectiveness. This approach helps educators design courses that are educationally sound, engaging, and stimulating for creative thinking.

3. Methodology

To elucidate the charm factors in aesthetic education curriculum design using clay and composite materials, we adopted the EGM and the Kano Model.

3.1. Evaluation Grid Method

EGM is a profound qualitative tool. It was deployed to dissect the nuanced perceptions and evaluative criteria of educators and learners in aesthetic education involving clay and composite materials in this study. A panel was formed with educators who were experienced in aesthetic education, experts in curriculum design, and psychologists. They reviewed the model through interviews focusing on creative learning. The interviews were conducted to unearth the underlying needs, interactive dynamics, and detailed assessments regarding the implementation and impact of clay and composite materials in aesthetic education.

3.2. Application of the Kano Model

The Kano Model was utilized to construct a dual-focused questionnaire and determine the satisfaction and dissatisfaction factors of educators and learners for the use of clay and composite materials in aesthetic education. This model was used to identify the attributes that significantly enhance educational experiences and distinguish between critical "basic" factors that cause dissatisfaction if unmet and "motivator" factors that elevate the learning experience. The questionnaire was created, encompassing elements relevant to the use of these materials in aesthetic education to scrutinize the importance and expectations. The results provide an understanding of their influence on educational satisfaction and outcomes. By integrating these methods, the effective use of clay and composite materials in aesthetic education curriculum design was assessed. Based on the results, we proposed recommendations for curriculum developers, educators, and professionals in aesthetic education for enhancing the engagement, creativity, and overall learning experience of students.

4. Results and Discussion

4.1. EGM Findings

Factors influencing students' decision making in aesthetic education were determined, focusing on a curriculum design with clay and composite materials. Three main factors were determined to affect aesthetic literacy, formative design skills, and creativity. These factors were crucial in evaluating the appeal of aesthetic education curricula (Figure 2). Assessments within aesthetic education curricula are crucial for evaluating students' understanding and expression of beaut, as it is important to enhance artistic literacy, expand aesthetic knowledge, and increase perceptual awareness and appreciation abilities. Students were engaged in the detailed analysis of visual elements and used artistic techniques

and color theory, nurturing their unique artistic styles and innovative thinking. Curriculum design with clay figures in aesthetic education encourages the creation of personalized sculptural creations, stimulating students' creative thinking. The creation of clay figures blends clay's tactile properties with diverse materials and techniques to achieve dynamics and intricate forms. Accessories and color coordination can be used to enhance visual impact, ignite imagination, and improve observational, reflective, and expressive abilities, leading to distinctive artistic styles.

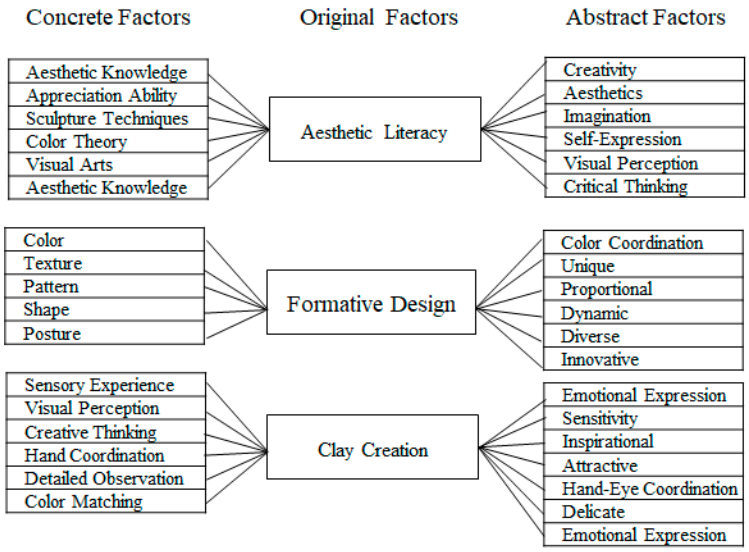

Figure 2. EGM results.

Hands-on clay activities in aesthetic education enrich sensory experiences and creativity. They improve hand–eye coordination and three-dimensional visual perception, and deepen students' understanding of color, shape, and proportion. This process boosts aesthetic literacy and critical art appreciation, with creation serving as a medium for emotional expression and psychological relief. Thus, creation using clay needs to become a part of aesthetic education, advancing technical skills, sensory experiences, creativity, aesthetic comprehension, and emotional expressiveness.

4.2. Results of the Kano Model

4.2.1. Kano Quality Attributes

Utilizing the Kano model's bidirectional questionnaire, we identified factors for students in aesthetic education with clay and composite materials. The frequency analysis results revealed that students focused on fundamental attributes such as creativity development, hand–eye coordination, and artistic skills, which collectively formed the 12 charm qualities listed in Table 1, resonating with diverse student interests and needs. Students enjoyed the creative process involving clay and composite materials, drawing from their life experiences. Clay-based athletic figure creation in the curriculum appealed to students, who wanted to present their favorite sports in clay. Creativity development in aesthetic education enhances creative skills and bolsters innovative thinking, problem-solving, confidence, and expressiveness, contributing to students' emotional and psychological growth. Skills such as hand–eye coordination and artistic techniques are crucial for refining artistic precision and quality for perceptual, observational, and creative growth, and confident artistic expression. Aesthetic education, thus, becomes an integral part of daily life. Teaching "artistic style" allows students to diversify their creative expressions, while "aesthetic cultivation" and "aesthetic appreciation" expand their understanding and sensitivity towards beauty, stimulating creativity. The clay creation activities enhance "spatial imagination" and "visual art" skills, offering students a rich experiential value and heightening their

course engagement. These charm qualities play a significant role in enhancing student involvement and the overall value of aesthetic education.

Table 1. Classification in Kano Model.

Factor Items	Weighted Classification of Kano Quality Attributes (%)						Kano Quality
	M	O	I	A	Q	R	Classification
1.Development of Creativity	6	34.5	13.1	44	2.4	0	A
2.Hand–Eye Coordination Skills	7.1	51.2	11.9	27.4	1.2	1.2	A
3.Artistic Creation Techniques	6	39.3	8.3	44	1.2	1.2	A
4.Cultivation of Aesthetic Sensibility	3.6	41.7	11.9	41.7	0	1.2	A
5.Aesthetic Appreciation Skills	3.6	36.9	8.3	48.8	1.2	1.2	A
6.Artistic Style	4.8	28.6	16.7	50	0	0	A
7.Emotional Expression	6	44	11.9	35.7	1.2	1.2	O
8.Stress Relief	6	44	11.9	35.7	1.2	1.2	O
9.Relaxation and Emotional Stability	3.6	50	9.5	34.5	1.2	1.2	O
10.Spatial Imagination	8.3	36.9	7.1	46.4	0	1.2	A
11.Problem-Solving Skills	7.1	40.5	13.1	36.9	1.2	1.2	A
12.Visual Arts	3.6	28.6	9.5	50	3.6	4.8	A

4.2.2. Kano Quality Improvement Indicators

The "CS Coefficient" in the Kano model analysis elucidates the degree to which the adequacy or inadequacy of a product's quality influences CS or dissatisfaction by using the "Satisfaction Improvement Coefficient" and the "Dissatisfaction Resolution Coefficient" [15]. The formula for the "extent of satisfaction" is given as (A + O)/(A + O + M + I) (1), and for "dissatisfaction resolution," it is -(M + O)/(A + O + M + I) (2), where A denotes Attractive qualities, O represents One-dimensional, M stands for Must-be, and I signifies Indifferent (frequency) (Figure 3).

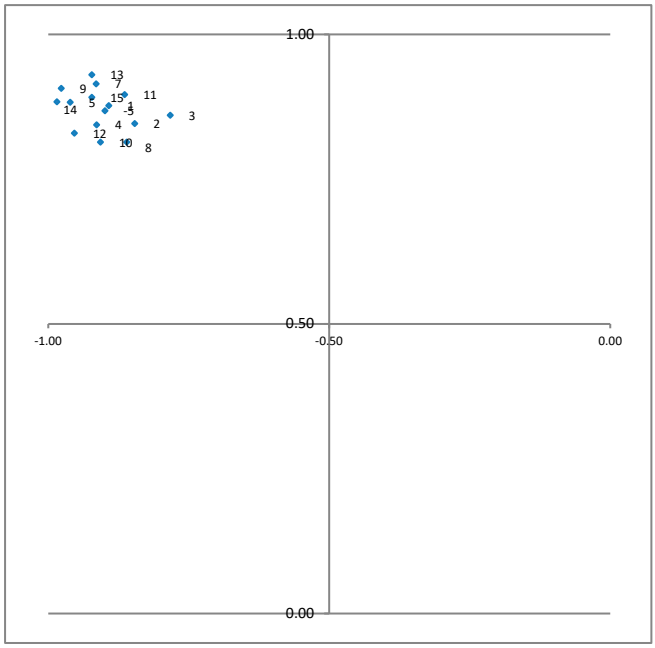

Figure 3. Matrix of Kano quality improvement indicators.

Applying CS-customer dissatisfaction (DS) values to ascertain the Kano model's quality attributes, the attributes in the upper right quadrant were categorized as Attractive qualities. These attributes surpassed basic consumer expectations, thereby providing additional satisfaction. Following a clockwise sequence, the quality attributes were classified as Indifferent, Must-be, and One-dimensional, respectively. The Attractive qualities are closely linked to consumer satisfaction, with their enhanced performance correlating with increased consumer contentment. Among the 12 evaluated factors, 9 were identified as Attractive qualities, which coincided with the Kano model's mode statistical outcomes. These particular items mirror consumer expectations, and their performance levels impact CS. In strategic planning, it is crucial to prioritize these Attractive quality items due to their significant influence within services or products.

4.2.3. Kano Weighting Method

The Kano Weighting Method is used for increasing satisfaction and mitigating dissatisfaction in determining CS. By comparing the "CS Increase Coefficient" and the "DS Reduction Coefficient" (Equation (1), the method identifies the attribute with the greatest impact (the coefficient with the larger absolute value). Initially, qualities lacking differentiation were omitted from consideration using (Equation (2).

$$C_i = \text{Max}\left[\frac{CS_i}{\sum_i^m CS_i}, \frac{CD_i}{\sum_i^m CD_i}\right] \quad (1)$$

$$W_i = \frac{C_i}{\sum_i^m C_i} \quad (2)$$

According to the weight analysis results from the Kano model (Table 2), the two factors with the highest significance were found: "Artistic Creation Techniques" (0.101) and "Spatial Imagination"(0.093). These factors were associated with consumer expectations and satisfaction. In clay and composite material creation contexts, students had explicit expectations regarding the output, seeking acknowledgment and comprehension of their artistic skills and imaginative prowess. Therefore, the considerable weights attributed to "Artistic Creation Techniques" and "Spatial Imagination" reflected a strong desire for their input and perspectives to be thoroughly respected and recognized within the clay creation course.

Table 2. Satisfaction and dissatisfaction degree and coefficient weights of quality attributes.

Quality Elements	CS/SUM	DS/SUM	MAX	Weights
1. Development of Creativity	0.805	−0.415	0.081	0.075
2. Hand–Eye Coordination Skills	0.805	−0.598	0.081	0.108
3. Artistic Creation Techniques	0.854	−0.463	0.086	0.083
4. Cultivation of Aesthetic Sensibility	0.843	−0.458	0.085	0.082
5. Aesthetic Appreciation Skills	0.878	−0.415	0.088	0.075
6. Artistic Style	0.786	−0.333	0.079	0.06
7. Emotional Expression	0.817	−0.512	0.082	0.092
8. Stress Relief	0.817	−0.512	0.082	0.092
9. Relaxation and Emotional Stability	0.866	−0.549	0.087	0.099
10. Spatial Imagination	0.843	−0.458	0.085	0.082
11. Problem-Solving Skills	0.793	−0.488	0.08	0.088
12. Visual Arts	0.857	−0.351	0.086	0.063

Regarding the Kano model, the factors with the lowest weights were identified as "Emotional Expression" (0.074) and "Hand–Eye Coordination Skills" (0.076). Although

these factors had relatively lower weights, this did not diminish their importance. Compared to other factors, these were perceived by consumers as basic or fundamental, being expected elements within the course design. For instance, emotional expression and hand–eye coordination were regarded as essential components in aesthetic education involving clay creation. Hence, the reduced weights of these foundational factors reflected their perceived elementary nature within the curriculum, particularly in comparison to factors that more directly address and fulfill specific consumer needs.

5. Conclusions

We explored the attributes influencing decision making in creating athletic figures with clay and composite materials. Through qualitative and quantitative analyses, various key factors were revealed. The results of the Kano model indicated that nine attributes were classified as Attractive qualities, which were especially valued by students and teachers in the decision-making process for clay athletic figure creation. These attributes met basic expectations and impacted CS in "Artistic Creation Techniques" and "Spatial Imagination" as the most influential factors. The results underscore the role of technical skill, imaginative capacity, and creativity in the creative process as being pivotal to enhancing CS. Recognizing the significance of the Attractive factors improves teaching quality and strengthens customer relationships. To optimize the outcomes in clay athletic figure creation and increase CS, course designers need to consider these decision-influencing attributes. The continuous refinement of course design and the fostering of long-term trust with consumers is recommended, too. Despite the Attractive qualities, consumer expectations and needs are changing. More research is necessary to develop a creative process model for course designers and educators to further investigate.

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