

Designing Teachers' Clothing Based on the Kano Model: A Case Study of Elementary School Teachers in Kerman Province

Maryamsadat Asnaashari^a, Abolfazl Davodiroknabadi^{b*}, Pedarm Peyvandi^c,
Mohammad Ali Shirgholami^a

^aDepartment of Textile Engineering, Ya.C., Islamic Azad University, Yazd, Iran
maryam.asnaashari54@gmail.com, ma.shirgholami@gmail.com

^bDepartment of Design and Clothing, Ya.C., Islamic Azad University, Yazd, Iran
davodi@iauyazd.ac.ir

^cDepartment of Textile Engineering, Yazd University, Yazd, Iran
peivandi@yazd.ac.ir

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Abstract

Accurate understanding and identification of user needs are among the key and vital factors in the process of product production and design. The Kano customer satisfaction model is one of the effective tools widely used in the field of customer satisfaction assessment. In this study, the factors influencing the design of mantos for female elementary school teachers in Kerman Province were identified using the Kano model. Initially, based on Gestalt principles applied in design, two questionnaires were developed by defining 13 design attributes. Out of a total population of 1,820 teachers in Kerman Province, the questionnaires were distributed among 200 participants. The first visual questionnaire included existing models of administrative mantos available in the market and was examined using the focus group method. In the second questionnaire, 13 functional and dysfunctional attributes were classified according to the Kano model categories. The design of the mantos was carried out after analyzing the results of the second questionnaire. To assess the reliability of the questionnaire, Cronbach's alpha coefficient was employed. Using SPSS software, the Cronbach's alpha value was calculated as 0.909, indicating a high level of reliability for the Kano model questionnaire items. The results of the Kano questionnaire revealed that aesthetic appeal, harmony of clothing, pocket design, social status, and attention to garment form were considered attractive design factors. In addition, the two attributes of clothing security and freedom of movement were identified as performance factors, indicating that these features are essential and fundamental in teachers' clothing design. Furthermore, color and fabric were recognized as reverse attributes, reflecting teachers' preference for wearing lighter colors. Other attributes, including price, age, climatic conditions, and local culture, were classified as indifferent factors.

Keywords: User needs; Kano customer satisfaction model; Manto design; Female teachers

1. Introduction

In the contemporary era, the art of fashion design has gained particular importance due to its application in various aspects of human life. Modern individuals, who continuously employ diverse tools and methods in competitive environments to achieve distinction and

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enhance their knowledge and insight, regard clothing as one of the most effective means and have benefited significantly from its impact on both personal and social life. Unlike the past, when clothing was produced solely to meet basic physiological needs, from the perspective of modern society, the characteristics and features of clothing are considered highly valuable for organizing social and psychological processes and for the development of cultural, artistic, and economic dimensions of society. Accordingly, the application of fashion design based on scientific principles grounded in the designer's understanding of the multifaceted nature of human existence is essential.

One of the key aspects to be considered in clothing design is attention to the physical dimension of the human body; in other words, the designer's understanding of body form, proportion, and movement plays a fundamental role in the design process. In addition, the influence of the psychological dimension of human beings on clothing design must also be taken into account. Viewing clothing within this framework relies on principles that originate from individuals' sensory and personality responses. Principles such as the social nature of human beings, the principle of beautification and the philosophy of aesthetics, the desire for attention, and the tendency toward novelty and variety are among the factors that compel fashion designers to consider these aspects when designing forms and models intended for the production cycle (Ghazali, 2015: 100).

Research has shown that understanding and applying users' personal needs in design is a key factor in product design success. Researchers have employed various methods to identify user needs. Functional analysis is one such method that has been endorsed by many scholars and is widely used to identify needs. User information analysis is another approach that focuses on interpreting the voice of the customer to extract user requirements. Among the models developed for needs analysis, the Kano model has been extensively used as an effective tool for understanding priorities due to its ease of use in classifying users' personal needs through questionnaires. Studies indicate that the advantage of employing the Kano model in categorizing customer needs lies in providing a clearer understanding of product performance. This method enables designers to focus more effectively on selecting priorities for product design development (Moghaddani et al., 2012: 60).

Since fashion represents an inevitable reality within societies, communities must, through accurate and proper identification of their cultural and social values, recognize clothing models that contribute to cultural progress and excellence and help shape cultural identity. Many clothing models currently in use are fundamentally incompatible with people's lifestyles and emotional sensibilities, and local and climatic conditions are often neglected. Meanwhile, emotional and cultural connections can significantly influence consumer satisfaction and awareness regarding clothing models and even brands (Elahi, 2015: 110). A considerable proportion of the working population consists of female teachers, a group that pays particular attention to fashion. However, the expansion of mass media and modern computer-based communication technologies has created extensive interactions with diverse societies and cultures, making the recognition and understanding of values, beliefs, and preferred patterns more complex and challenging. Consequently, existing conditions have, in some cases, led women to experience confusion in selecting appropriate clothing, and teachers are no exception. Each year, at the beginning of the academic year, teachers enter their workplaces wearing a wide variety of clothing styles. Clothing selection by teachers, like that of other individuals, depends on numerous factors, including age, gender, cultural and social status, prevailing societal patterns, religious contexts, and regulations established by legislators.

Therefore, the aim of the present study is to employ the Kano model to identify the factors influencing the design of mantos for female elementary school teachers in Kerman Province. The Kano model is capable of identifying required attributes as well as those user needs that may initially appear difficult to recognize.

1.1. Literature Review

The Kano Model

Dr. Noriaki Kano introduced the Kano customer satisfaction model in his seminal paper (Kano, 1984: 40). In this model, customer requirements, or in other words, the quality attributes of products, are classified into three categories. According to the Kano model, customer satisfaction can be explained based on these three groups of product/service attributes:

a) Basic (Must-be) Attributes:

The first category consists of basic requirements. When these fundamental requirements are fully met in product development, they merely prevent customer dissatisfaction and do not generate satisfaction or delight. Therefore, basic attributes do not create a competitive advantage for the product.

b) Performance Attributes:

The second category includes performance requirements. Failure to meet these attributes results in customer dissatisfaction, whereas their adequate and complete fulfillment leads to customer satisfaction and contentment.

c) Attractive (Motivational) Attributes:

The third category comprises attractive or motivational requirements. From the customer's perspective, these attributes are not perceived as essential needs during product use; therefore, their absence does not cause dissatisfaction. However, when these attributes are incorporated into the product, they generate a high level of satisfaction and excitement among customers.

Kano illustrated these three categories of requirements in a two-dimensional diagram. The horizontal axis represents the degree to which each quality attribute of the product is provided and fulfilled, while the vertical axis indicates the level of customer satisfaction with the product's quality attributes. The highest and lowest points on the vertical axis represent the states in which the customer experiences extreme satisfaction or dissatisfaction. The intersection of the horizontal and vertical axes indicates a state of equilibrium, where the customer is neither satisfied nor dissatisfied (Kano et al., 1984: 40).

A comparison between performance quality parameters and user satisfaction parameters demonstrated that the definition of quality is far more complex and holistic. The relationship between quality along these two axes led Dr. Kano to identify three distinct definitions of quality: basic or must-be quality, performance or one-dimensional quality, and attractive or excitement quality (Figure 1).



Figure 1. Kano Customer Satisfaction Model

The Kano model is formed based on the combination of the fulfillment of functional attributes (horizontal axis: full fulfillment of needs vs. non-fulfillment of needs) and the feeling of satisfaction (vertical axis: complete satisfaction vs. dissatisfaction) experienced by consumers in relation to a product. Kano stated that different levels of product performance and emotional response are perceived through product attributes, and designers should apply an appropriate combination of these attributes during the product design process. To achieve the desired levels of performance and emotional satisfaction, product attributes are categorized according to Kano's quality elements. In the Kano model, product quality attributes are classified into five categories based on their impact on user satisfaction and expectations: must-be (mandatory) attributes (M), performance (one-dimensional) attributes (O), attractive (excitement) attributes (A), indifferent attributes (I), and reverse attributes (R) (Bilgili, 2011: 832).

a) Must-be (Mandatory) Attributes:

These refer to aspects of a product or service that, when fulfilled, have a minimal effect on customer satisfaction; however, when they are not fully satisfied, they lead to a high level of customer dissatisfaction. These attributes represent consumers' basic expectations or "must-haves." Although they are not explicitly expressed by users, they must be identified due to their critical importance to customers.

b) Performance (One-Dimensional) Attributes:

The fulfillment of these needs has a linear relationship with the level of satisfaction, meaning that the better these needs are met, the higher the level of customer satisfaction, and vice versa.

c) Attractive (Excitement) Attributes:

The complete fulfillment of these needs results in a high level of customer satisfaction; however, their absence does not cause dissatisfaction. These needs represent consumers' aspirations and are rarely expressed explicitly. In fact, they address latent needs—real needs of which consumers may not be consciously aware.

d) Indifferent Attributes:

These are features that have no significant effect on customer satisfaction.

e) Reverse Attributes:

These are features that lead to customer dissatisfaction when present (Bilgili et al., 2011: 832).

For example, if a sarafan were designed instead of a manto for teachers, it would result in a high level of dissatisfaction, whereas a long-sleeved manto would not generate satisfaction because it is considered a mandatory requirement. An attractive attribute in the product could include a novel design for pockets, cuts, or collars.

Kano and his colleagues employed functional (positive) and dysfunctional (negative) questions to collect users' opinions regarding product attributes and to identify and classify them within the framework of quality elements. Accordingly, for each attribute, one question is posed consisting of two parts. The first part addresses the positive aspect of the attribute, examining how individuals feel if the specified feature is present in the product or their work context. The second part relates to the negative aspect and examines how individuals feel if the specified feature is absent. This approach allows for the assessment of users' emotional responses to both the presence and absence of each attribute (Lin et al., 2010: 257). The structure of the questionnaire for functional and dysfunctional questions is presented in Table 1. Five response options are provided for each question.

Table 1. Structure of Functional and Dysfunctional Questions in the Kano Questionnaire

| Functional Question | Dysfunctional Question |
|---|---|
| How do you feel if the product has the specified attribute? | How do you feel if the product does not have the specified attribute? |
| I like it | I like it |
| It must be that way | It must be that way |
| I am neutral | I am neutral |

| | |
|--------------------|--------------------|
| I can live with it | I can live with it |
| I dislike it | I dislike it |

Using this questionnaire, teachers' perceptions of the investigated attributes are identified, and the attributes are subsequently evaluated within the framework of quality elements using the Kano classification and evaluation table (Table 2). Accordingly, based on the combination of responses to the functional and dysfunctional questions, the attributes are classified according to the Kano evaluation matrix. For each teacher, the Kano evaluation table is applied, and based on the frequency of responses, the dominant perspective of the teachers determines the category to which each attribute belongs.

Table 2. Kano Evaluation Table

| User Requirement (Dysfunctional) ↓ / Functional Response | Like | Must-be | Neutral | Can live with | Dislike |
|--|-----------------|-----------------|-----------------|----------------|---------------------|
| Like | Questionable(Q) | Attractive (A) | Attractive (A) | Attractive(A) | One-dimensional (O) |
| Must-be | Reverse (R) | Indifferent (I) | Indifferent (I) | Indifferent(I) | Must-be (M) |
| Neutral | Reverse (R) | Indifferent (I) | Indifferent (I) | Indifferent(I) | Must-be (M) |
| Can live with | Reverse (R) | Indifferent (I) | Indifferent (I) | Indifferent(I) | Must-be (M) |
| Dislike | Reverse (R) | Reverse (R) | Reverse (R) | Reverse (R) | Questionable(Q) |

1.2. Validity and Reliability of the Questionnaire

In the social and behavioral sciences, most research is conducted using questionnaires. Quality control of questionnaire results is considered similar to testing in experiments. Generally, a good test should possess desirable characteristics such as ease of administration, practicality, ease of interpretation, validity, and reliability. In this study, the reliability of the questionnaire was assessed using Cronbach's alpha coefficient, which is more commonly used than other methods (Sarmad et al., 2017: 123). The Cronbach's alpha value calculated through SPSS software was 0.909, indicating a high level of internal consistency and reliability of the items related to the Kano model. The validity of the questionnaire was evaluated by university professors, and after addressing their comments and correcting deficiencies, it was approved.

1.3. Research Methodology

This study is descriptive field research. Given that the research topic involves designing a model and its evaluation and testing, it began with a review of library-based and descriptive studies, as well as the validation of identified indicators. The productivity factors influencing teachers' mantos were extracted from the literature. These indicators were then confirmed by experts (university professors). Subsequently, the Kano questionnaire was designed using the identified attributes. After designing and finalizing the questionnaire, the field phase and data collection commenced.

The target group of this study comprises elementary school female teachers in Kerman Province. The case study focuses on designing mantos based on the characteristics of this target group, who share common occupational conditions and climatic circumstances. Out of a total of 1,820 female elementary school teachers, 200 participants were selected from various age groups.

Based on Gestalt principles in design, two questionnaires were developed by defining 13 attributes. The first visual questionnaire included 20 existing administrative manto models available in the market and was examined through the focus group method. The factors

examined in this questionnaire included: emphasis on dark-colored mantos, emphasis on light-colored mantos, emphasis on sleeve cuffs (pocket sleeves), emphasis on sleeve cuffs (cuffed sleeves), emphasis on sleeves (kimono sleeves), emphasis on floral fabric, emphasis on concealed buttons, emphasis on collar design (collarless), emphasis on collar design (closed-standing collar), emphasis on unconventional designs, emphasis on common administrative styles, emphasis on simplicity, emphasis on manto cut (bishop cut), emphasis on cut (shoulder seam cut), emphasis on loose and comfortable fit, emphasis on tight-fitting styles, emphasis on decorative pocket flaps, and emphasis on large pockets. Several examples of the designed mantos are shown in Figure 2.



Figure 2. Examples of Designed Manto Models

In the second questionnaire, 13 attributes were selected as influential factors in the design of mantos for female teachers. These attributes were classified functionally and dysfunctionally according to the Kano model categories. The attributes are described as follows:

Freedom of Movement: Freedom of movement or the overall ability to perform tasks means that nothing should hinder a person from carrying out their desired actions. In this study, focus groups were used to survey opinions regarding freedom of movement in teachers' uniform mantos, and the results were utilized in designing new mantos.

Security and Coverage: Security is a familiar and recognizable concept across all human societies. The basis of seeking security can be traced to human motivations and drives. Generally, teachers aim to wear mantos that are modest and comfortable. They prefer school uniforms that provide a complete sense of security and adequate coverage. This study surveyed the degree of security and coverage provided by the mantos.

Form and Aesthetics: Clothing aesthetics hold special importance for women. Therefore, this study examined simple and elegant mantos to design the most aesthetically pleasing

models, focusing on cuts and decorations that enhance the beauty and attractiveness of the mantos.

Color and Fabric: In clothing design, fabric quality is of great significance. Designers must select appropriate materials based on the user's climatic conditions and the intended design. Regarding color, the user's social position and working environment must be considered. These factors were also included in the survey.

Modeling: Modeling refers to the conceptualization or ideation process. Users were asked to express their feelings toward simple and modeled mantos.

Age and Social Status: Teachers hold a particular social status in society. Each age group prefers specific cuts and styles, and this factor was also evaluated through the survey.

Cost and Uniformity: Teachers, as part of the workforce, often wear coordinated uniforms. Therefore, the harmony and coordination of their uniform designs are of special importance and were assessed in this study.

2. Results and discussion

Various techniques and methods exist for analyzing and interpreting Kano questionnaires. In this study, the analysis was conducted based on the mode (the most frequent response). Accordingly, the results were combined in the Kano table, and product attributes were classified into Kano quality categories based on the frequency of responses (Azizi et al., 2012: 84). In this method, a new column is added at the end of the table, where the response with the highest frequency for each attribute is selected. The results of this questionnaire analysis are presented in Table 3.

As observed in Table 3, the attributes of aesthetics, garment coordination, modeling, social status, and emphasis on the form of teachers' clothing are classified as attractive factors, possessing the highest percentages compared to other attributes. This indicates teachers' preference for mantos featuring these characteristics. Two attributes—security of coverage and freedom of movement—were identified as performance factors, highlighting their fundamental and essential role in the design of teachers' clothing. Additionally, it was found that color and fabric are categorized as reverse attributes, reflecting teachers' preference for wearing lighter colors. Other attributes, including price, age, climatic conditions, and local culture, were classified as indifferent factors.

The customer satisfaction coefficient is another statistical indicator that can be used in data analysis. Its numerical value evaluates the extent to which a product attribute influences user satisfaction or, conversely, how its absence contributes to user dissatisfaction (Qianly, 2009: 89). The formulas for calculating the satisfaction coefficient and dissatisfaction coefficient are as follows:

$$\frac{A + O}{A + O + M + I} \quad \text{Satisfaction rate}$$

$$\frac{O + M}{(A + O + M + I)(-1)} \quad \text{Dissatisfaction rate}$$

The user satisfaction coefficient ranges from zero to one (0 to 1). The closer this coefficient is to 1, the greater the user's satisfaction with that attribute; conversely, a value closer to zero indicates that the attribute has minimal influence on user satisfaction. On the other hand, the dissatisfaction coefficient ranges from zero to minus one (0 to -1). The closer this value is to -1, the stronger the attribute's impact on user dissatisfaction. A value of zero for this index indicates that the absence of the attribute in the product does not cause dissatisfaction.

Based on the data presented in Table 3, the satisfaction and dissatisfaction coefficients were calculated for each of the 13 attributes, and the results are shown in Table 4. As observed in Table 4, the attributes of aesthetics, garment coordination, modeling, social

status, and emphasis on the form of teachers' clothing—classified as attractive factors—also exhibit high customer satisfaction coefficients. This suggests that enhancing and incorporating these attributes will likely increase user delight during product use.

The two attributes of security of coverage and freedom of movement, identified as performance factors, also demonstrate high user satisfaction coefficients. This indicates that special attention should be given to these features in the design process. The satisfaction and dissatisfaction coefficients for the climatic conditions attribute, classified as an indifferent factor, are close to zero, implying that the presence or absence of this attribute has little to no effect on customer satisfaction or dissatisfaction.

Table 3. Frequency Distribution of Responses

| Attribute | A(%) | O(%) | M(%) | I(%) | R(%) | Q (%) | Total(%) | Kano Category |
|--------------------------------|-------|-------|-------|-------|-------|-------|----------|---------------|
| Color | 5.03 | 38.19 | 17.59 | 3.52 | 9.05 | 26.63 | 100 | R |
| Fabric | 4.55 | 45.45 | 24.75 | 7.58 | 8.59 | 9.09 | 100 | R |
| Price | 3.52 | 13.57 | 48.24 | 6.03 | 14.57 | 14.07 | 100 | I |
| Aesthetics | 3.54 | 1.01 | 16.16 | 9.60 | 28.79 | 40.91 | 100 | A |
| Coverage Security | 0.00 | 2.60 | 23.44 | 25.00 | 28.13 | 20.83 | 100 | O |
| Freedom of Movement | 3.03 | 6.06 | 17.17 | 13.64 | 30.30 | 29.80 | 100 | O |
| Pocket Design Modeling | 5.05 | 3.54 | 26.26 | 8.59 | 15.66 | 40.91 | 100 | A |
| Outfit Coordination (Matching) | 42.21 | 22.11 | 11.06 | 21.61 | 3.02 | 0.00 | 100 | A |
| Age Appropriateness | 6.53 | 9.05 | 34.17 | 10.55 | 9.55 | 30.15 | 100 | I |
| Climatic Conditions | 4.57 | 3.55 | 49.10 | 12.18 | 12.18 | 27.41 | 100 | I |
| Social Status | 0.00 | 2.56 | 19.49 | 11.28 | 24.62 | 42.05 | 100 | A |
| Local Culture | 4.04 | 3.54 | 42.93 | 8.59 | 12.12 | 28.79 | 100 | I |
| Importance of Garment Form | 36.68 | 21.61 | 10.05 | 28.14 | 3.02 | 0.50 | 100 | A |

Table 4. Customer Satisfaction and Dissatisfaction Coefficients for the 13 Attributes of Female Teachers' Manto

| Attribute | Satisfaction Coefficient | Dissatisfaction Coefficient |
|--------------------------------|--------------------------|-----------------------------|
| Color | 0.628 | -0.221 |
| Fabric | 0.353 | -0.323 |
| Price | 0.345 | -0.248 |
| Aesthetics | 0.730 | -0.402 |
| Coverage Security | 0.502 | -0.545 |
| Freedom of Movement | 0.661 | -0.483 |
| Pocket Design Modeling | 0.618 | -0.265 |
| Outfit Coordination (Matching) | 0.663 | -0.341 |
| Age Appropriateness | 0.470 | -0.238 |
| Climatic Conditions | 0.073 | -0.044 |
| Social Status | 0.684 | -0.368 |
| Local Culture | 0.442 | -0.224 |
| Importance of Garment Form | 0.604 | -0.328 |

Studies conducted on the form of mantos revealed that although teachers identify aesthetically pleasing mantos with pocket modeling as their ideal, in practice they prioritize freedom of movement and comfort due to increased interaction. At the same time, they also desire an attractive manto design. The manner in which the models are presented to teachers plays a key role in eliciting their feedback, as users' emotional reactions to images of mantos are stronger than to sketches or drawings. This highlights the undeniable impact of color and design on these models, as well as their role in attracting teachers to specific clothing forms. The initial impression of these models significantly influences the users' (teachers') feelings toward the designs and their decision to order,

with this emotional response being sustained and exerting a lasting effect on their final choice.

3. Conclusion

Today, one of the primary concerns of designers is to what extent the products they create can satisfy users and understand their needs. Various methods exist to extract and prioritize customer needs, among which the Kano model is an effective approach for analyzing customer requirements and understanding their priorities. The advantage of using the Kano model in classifying customer needs lies in gaining a better understanding of product performance.

Clothing and attire are unique to humans and have always been an integral and essential part of human life. However, many clothing models used today are fundamentally inconsistent with the culture, climate, social status, and living conditions of the users. Therefore, the aim of this study was to employ the Kano model to design mantos for female elementary school teachers in Kerman Province. The results showed that although teachers identified aesthetically pleasing mantos with pocket modeling as their ideal, in reality they prioritize freedom of movement and comfort due to greater interaction. At the same time, they also desire an attractive manto form. The manner in which the models were presented to teachers was a key factor in eliciting their opinions, as users' emotional reactions to images of mantos were stronger than to sketches.

The Kano questionnaire results indicated that attributes such as beauty, garment coordination, pocket modeling, social status, and emphasis on the form of teachers' clothing are categorized as attractive factors. This demonstrates teachers' preference for mantos possessing these features. Two attributes (security of coverage and freedom of movement) were identified as performance factors, emphasizing their fundamental and essential role in designing teachers' clothing. Additionally, color and fabric were recognized as reverse factors, reflecting teachers' preference for wearing lighter colors. Other attributes such as price, age, climatic conditions, and local culture were classified as indifferent factors.

Based on the observed results, it can be concluded that the Kano model is one of the most contemporary theories in design and user satisfaction. Its analytical method is technically elegant, and designers can use it as a bridge between the technical aspects and interactive user experience in the design process. The Kano model serves as a precise emotional tool for understanding and identifying user needs.

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