

THE DIFFICULTIES OF USING KANSEI ENGINEERING METHOD IN IRAN

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ABSTRACT

Kansei Engineering is not well-known in Iran. This study presents a pioneer work in Iran using Kansei Engineering to design a desk for art students and addresses the difficulties faced during this project. Kansei Engineering type I was used because it was compatible with available resources and its required training was straight forward considering unfamiliarity with Kansei Engineering in Iran. Forty study participants were chosen from undergraduate art students at Tabriz Islamic Art University. During this study, we faced such as: a) lack of knowledge about Kansei Engineering, limiting designers to design for specific target groups; b) long delay in answering to the first section questionnaire; c) unfamiliarity with Semantic Differential method; d) difficulty of study participants in relating the images to the words; and e) unfamiliarity with product personality. Adopting Kansei Engineering to Iranian culture would assist Iranian designers to achieve suitable results. To use Kansei Engineering in Iran, it is therefore recommendable to reduce the number of questions in questionnaire, training of study participants about SD method and product personality, and use of product itself instead of their images.

Keywords: *Kansei Engineering, Product Design, Emotional Design, Semantic Differential method.*

1. INTRODUCTION

In today's competitive environment, satisfying customer needs has become a great concern of almost every company [2]. While there are various customer needs, the functional and affective needs have been recognized to be of primary importance for customer satisfaction

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[5, 7]. In particular, mass customization and personalization are increasingly accepted as an important instrument for firms to gain competitive advantages [12]. Moreover, with the development of global markets and modern technologies, it is likely that many similar products will be functionally equivalent. Customers may find it is difficult to distinguish and choose many product offerings [6]. Design for performance (e.g. functional design) and design for usability (e.g. ergonomic design) no longer empower a competitive edge because product technologies turn to be mature, or competitors can quickly catch up [5]. Kansei Engineering (KE) is “a new technology for designer to develop product that satisfy user’s affective need.” [1]. Recently, KE has been progressively used in different areas including architecture, industrial design, product design, automotive industry, electronic device, home equipment, work equipment, basic research, ... [4]. Measuring the Kansei is being done: People’s behaviors and actions, words (spoken), facial and body expressions, physiological responses (e. g. Heart Rate, EMG, EEG) [7]. Considering the significance of study emotional relation between students and their desk seems to be important, KE is the best ways for design an emotional desk. However, KE is not well-known in Iran. This study presents a pioneer work in Iran using KE to design a desk for art students and addresses the difficulties faced during this project. This project has three main aims: first) evaluation of KE model as a suitable method in Iran, second) a review of available tables and finding relations between psychological and factual characteristics of product, and third) designing tables using gathered information from consumer and its accordance with characteristics of supposedly ideal table.

2. MATERIAL & METHODS

For this study, KE type I was used. This chooses was informed with limitation in available resources and its relatively straight forward training considering unfamiliarity with KE in Iran. KE model proposed by Schütte [10] was used in our study.

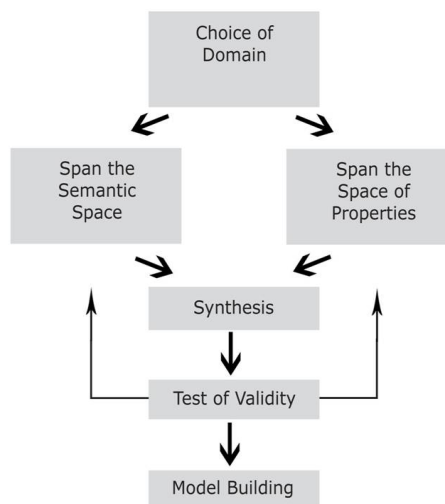


Figure 1: KE model proposed by Schütte

Schütte proposed model is a six step process where different methods may be used within each step [10]. Some of the methods are not unique for Kansei Engineering like factor analysis and regression models. The Kansei Engineering process is rather a methodology that implements different techniques to link product emotions with product properties. In the process the chosen product domain is mapped from both a semantic and physical perspective. The Kansei are linked to corresponding physical properties. A prediction model is then built and validated [3].

2.1. Choosing the Domain

Forty study participants were chosen from undergraduate art students, aged between 18-45 years, at Tabriz Islamic Art University, Iran.

2.2. Spanning the Semantic space

Words describing the product domain were collected from the following source: magazine, manuals, users, dictionary, internet, interview, In this step no analysis has been done yet and related words have been gathered only. Every describing word has been gathered so that, every source was exhausted. Users of product have offered important words and at the end, a total number of 560 brought together and then after omitting synonyms and similarities the number of words has been reduced to 356. 356 resulted terms have been divided to 20 groups. In second stage the number of terms has been reduced to 79. In third stage the most vivid words appropriate to semantic space of project have been selected. 33 remained words have been investigated separately and in conclusion, these 33 words have been selected as ultimate kansei words describing semantic atmosphere of product (the Desk). All stages of work have been documented on paper. Selected words show in the table 1.

Table 1: Collection of Kansei word

Compact	Private	Spacious	Magnificence	Friendly	Organized
Study-Oriented	Warning	Cooperative	Serious	Dignified	Classic
Spiritual	Energetic	Encouraging	Confidence	Social	Stress-Free
Creative	Inward	Harmonious	Natural	Modern	Functional
Perpetuity	Safe	Compatible	Simple	Comfortable	Kindly
Science-Fictional	Distinctive	Brief			

2.3. Spanning the Space of Properties

10 types of desks were chosen in the same size and angles that were different in terms of the feeling that they evoked [8, 9].

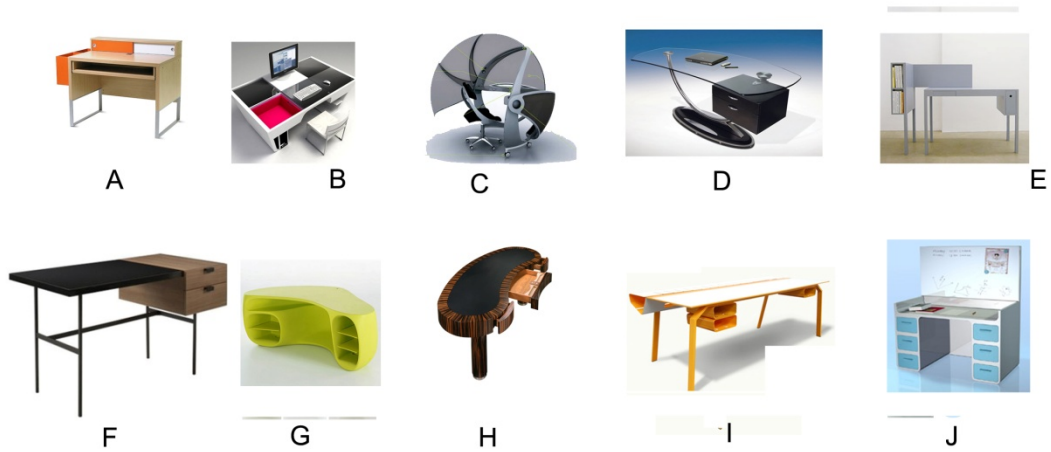


Figure 2: Ten types of desks

As the next step, a questionnaire was prepared (Semantic Differential method) using the selected words and images of the selected desks [9, 11]. The questionnaire was distributed among study participants asking them to explain about colors, forms and qualities of models. Separately, 15 designers were asked to virtually design a suitable desk for art students and accordingly answer the questionnaire [3].

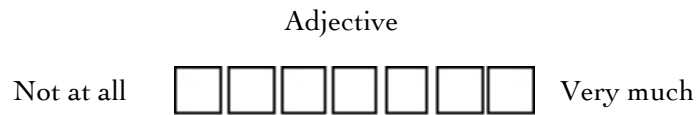


Figure 3: Semantic Differential method

3. RESULT

The data was treated in Excel. Figure 4 shows the Kansei profile ideal desk using the result of questionnaire from 15 designers.

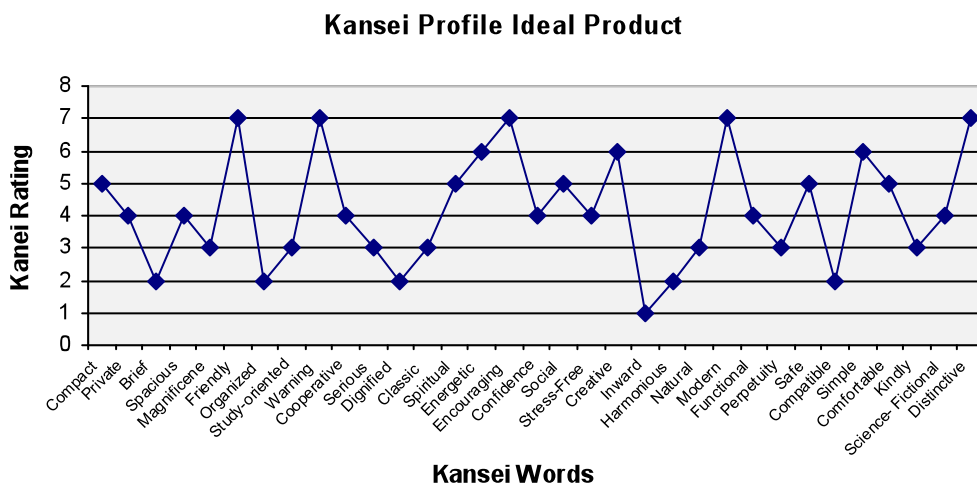


Figure 4: Kansei profile ideal desk

3.1. Synthesis

The data was treated in a Factor analysis and Cluster analysis. This was done in EXCEL and SPSS (Statistical Package for Social Sciences) which is commercial statistical software.

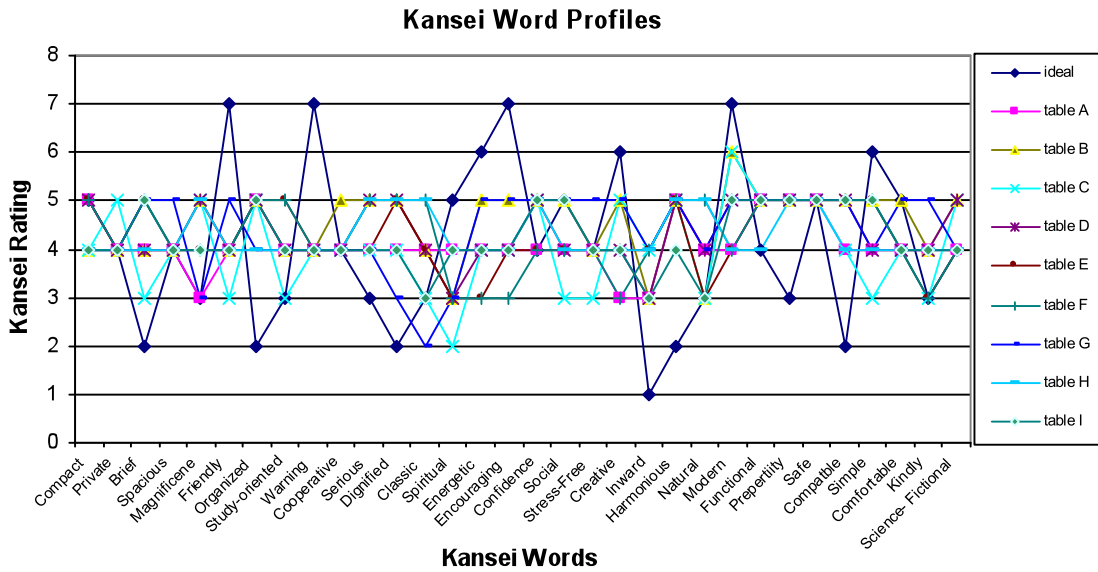


Figure 5: Kansei word profile.

By factor analysis the Kansei words were decreased and categorized.

Table 2: New categories of Kansei word for color

Factor 1		Factor2	Factor 3	Factor 4	Factor 5
Effective		Cooperative	Focused	Oriented	Comfortable
Compact	Simple	Magnificence	Spacious	Oriented	Social
Brief		Study-oriented	Energetic	Warning	Stress-free
Organize		Cooperative	Creative	Spiritual	Comfortable
Confidence		Serious	Inward	Encouraging	
Harmonious		Dignified	Modern		
Perpetuity		Classic	Functional		
Safe		Natural	Science-fictional		
Compatible					

The colored adjectives are more than four rating in ideal table. The adjectives were compared with their average of colors ($x > 4$), the results are shown below :

Oriented: Table J, Table **G**

Warning: Table **I**, Table **G**, Table **B**

Spiritual: No table

Encouraging: Table A, Table **B**, Table **G**, Table **I**

Table B, G, I are more.

Table 3: New categories of Kansei word for qualities

Factor 1	Factor2	Factor3	Factor4	Factor5
Spiritual	Integrated	Modern/Lovable	Minimal	Simple
Magnificence	Organize	Private	Compact	Stress- free
Oriented	Serious	Spacious	Brief	Simple
Classic	Confidence	Dignified	Functional	
Spiritual	Harmonious	Encouraging		
Inward	Perpetuity	Creative		
Natural	Safe	Modern		
Kindly	Compatible	Safe		
Warning	Distinctive	Science- fictional		

Encouraging: Table **B**, Table **G**

Creative: Table **B**, Table **D**

Modern: Table **B**, Table **C**, Table **D**, Table I

Tables B,G,D are more .

Table 4: New categories of Kansei word for form

Factor 1	Factor2	Factor3	Factor4	Factor5
Targeted	Useful	Distinctive	Creative	Serious
Brief	Compact	Organize	Energetic	Spacious
Confidence	Private	Private	Creative	Serious
Social	Magnificence	Study- free	Kindly	Dignified
Modern	Study-oriented	Harmonious		Comfortable
Perpetuity	Cooperative	Distinctive		
Safe	Classic			
Compatible	Spiritual			
Simple	Natural			
	Functional			

As the same way was explained earlier, the results are shown below:

Social: Table **B**, Table **G**, Table **I**

Modern: Table **B**, Table C, Table D, Table **E**, Table **G**, Table **I**, Table H

Safe: Table **B**, Table A, Table D, Table **E**, Table F, Table **G**, Table **I**, Table J

Tables B ,G ,I and E are more .

At the end, Comparison Kansei word of ten desks with the ideal desk, made a new Category of Kansei words. At the end Four desk (Type: B, E, G and I) were chosen from the samples according to the analysis of answer to the questionnaire. The final result is shows in the table 2.

Table 5: Final result of factor analysis & cluster analysis

Form oriented	Material Modern/gracious	Color Friendly
Social	Encouraging	Friendly
Modern	Creative	Warning
Safe	Modern	Spiritual
Simple	Comfortable	Encouraging
Choice desk: B,G,E,I	Choice desk: B,G	Choice desk: G,B,I

3.2. Model Building and Test of Validity

The characteristics of these four desks together with extracted words through factor analysis of questionnaires were then used to draw sketches of desks and then we select three new designs of desks. A new questionnaire was prepared using these three desks and submitted to the study participants of whom 30 persons responded.



Figure 6: Three developed desks

The final desk was designed by analysis of the answers to the final questionnaires.

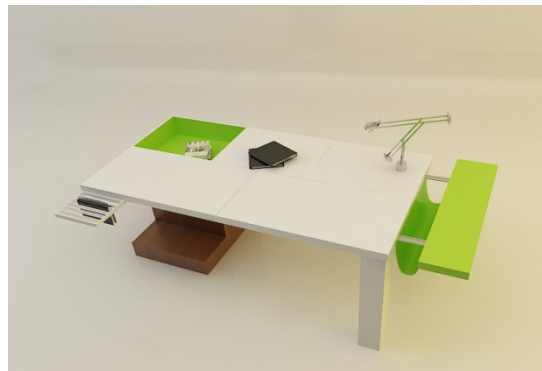


Figure 7: Final desk

4. DISCUSSION

This study applied KE type I to design a desk for undergraduate art students in Iran. Emotions of study participants were quantified using factor and cluster analyses to design the final desk. KE type I was used because it was compatible with available resources and its required training was straight forward considering unfamiliarity with KE in Iran. This study faced some difficulties in each stage. In word collection was the following difficult: a) not being truthful and being conservative in expressing personal emotions; b) domination of current traditional values over personal outlooks; c) lack of diversity in answers; d) problem with metaphorical denotations of words in Persian language; e) bindings and denotations of the word “desk”, striking into the minds of addressees; f) different cultural outlooks over the country make a real difference in conclusion. In answer to questionnaire 1 was the following difficult: a) Lack of knowledge about KE in Iran, limiting designers to design for specific target groups (i.e. art students); b) Long delay in answering to the first section questionnaire; c) Unfamiliarity with SD method; d) Difficulty of study participants in relating the images to the words; e) unfamiliarity with product personality; f) each adjective has had various

denotations for voters. In answer to questionnaire 2 there were some obstacles similar to answer to questionnaire 1, but in this case there was no supervisor with extra- explanation

5. CONCLUSION

Adopting KE to Iranian culture would assist Iranian designers to achieve suitable results. To use KE in Iran, it is therefore recommendable to reduce the number of questions in questionnaire, training of study participants about SD method and product personality, and use of product itself instead of their images. Physiological responses are more factual answers can be elicited from subconscious level of consumer's mind. Therefore, we are going to planning for measuring kansei engineering in the next our research based on Physiological responses.

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