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The necessity for translating the users' feelings about the architectural design (Case Study: Designing the children's play space)[1]

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ABSTRACT

In this century, the space user's demands are less taken into account due to the emergence of building mass and the prefabricated materials. Therefore, the users use several ways in designing.
The Quality Function Deployment (QFD) and Kansei Engineering are among these methods. In this method, the QFD method and Kansei Engineering are utilized to investigate the features of children's play space.
In fact, this paper aims at designing the proper children's play space by Kansei Engineering and QFD method which translates the children's feelings according to the target space.
The research has the interdisciplinary approach and uses the Kansei Engineering and QFD method in product design and then architecture design.
The analyzed data confirms that there is a direct correlation between the features of children's play space and their feelings, and thus this study investigates the children's feelings about the form and functional features in designing the children's play space.
KEYWORDS: Kansei Engineering, Quality Function Deployment (QFD), Children's play space, emotional design

1.INTRODUCTION

Due to the industrial revolution, as the era of iron development, in recent decades, the unthinkable changes are made in various fields such as the architecture and industrial design and the human being is considered only as the consumer with no feeling, thus the mental disorders and diseases have increasingly taken over the society, so that the human has led to the absurdity. Recently, the designers have had higher tendencies towards the emotional design. When Donald Norman's recent book named the "emotional design" was released in the early 2004, the fundamental changes were created in generalities and details of user's experience design world.

There are different reasons for using the emotional design. Some of the designers utilize the emotional design in order to acquire the customer. In other words, it is necessary to consider the emotional aesthetic approach in addition to the main performance and this is one of the serious competitive challenges. Others use the emotional design which arouses the users' different senses in different fields of vision, hearing, smell, touch, and taste and more importantly all these products arouse the emotions in users and create a positive sense and satisfaction in user and help the human get rid of this reutilization and robotic life.

It is difficult to identify this emotional and experimental approach and it is more difficult to arouse the space user's emotion.

Nowadays, different methods can be utilized to translate the users' feelings in product designing and also the space design in architecture. The Quality Function Deployment (QFD) and Kansei Engineering are among these methods.

2.RESEARCH METHODOLOGY

The Kansei words evaluate the users' emotions, and the Quality Function Deployment (QFD) method investigates the words physical characteristics in designing the children's play space. The more the user's emotions are accurately translated, the less the effects of space on user are stochastic.

The following steps are suggested for designing according to Kansei words and the Quality Function Deployment (QFD):

1- Collecting and categorizing the samples (low-medium-high classes);

[1] This article was extracted from T.Abbania Tehrani thesis of M.A of the same title which was done in the Boroujerd university of Science and Research in 2013.

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2- Finding the Kansei emotional words according to the children's drawings;
3- Finding the ideal architectural elements of children play space;
4- Finding the relationship between the Kansei emotional words and architectural elements of play space;
5- Finding the architectural elements associated with users' feelings

3.Emotional design

Nowadays, the scientists have found the important roles of emotions in everyday human life. Undoubtedly, the usefulness is important in a product[1].

The emotions are the integral parts of life[1]. The emotions are the integral parts of human consciousness and reflect our complex interaction of thought and body [2]. Nowadays, it is believed that the emotions change the way of solving problems by human brain [1].

The initial sparks of such there thoughts have roots in themid-20th century AD exactly when the mass of products have become increasingly similar in terms of technology, performance and quality and led to the creation of stronger emotion connection between user and products[3].

The most obvious sign and symbolic action of failure and alienation of space user's feelings can be seen in destruction of Pruitt-Igoe housing projects by dynamite because it was the only way to end the suffering in residents and the building itself.

According to Jenkins, the architect should not design a building and whatever is common in modern architecture all on his own, but he should be the partner and advisor of users. The model of building shape should not be only in architect's mind, but it should be something that the building residents have intimacy and familiarity with it and can emotionally communicate with it.

According to the knowledge about this information, the companies have found that the consideration of feelings in projects and genuine opportunities enables the producers and designers to engage their customers in designing their products, for instance, Nike Company has involved the customers in selecting the optional colors and other decorations for sports shoes according to an innovative thinking [4].

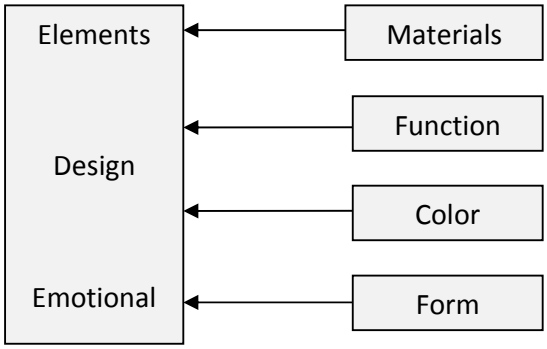

Fig. 3.1. Diagram Emotional design elements

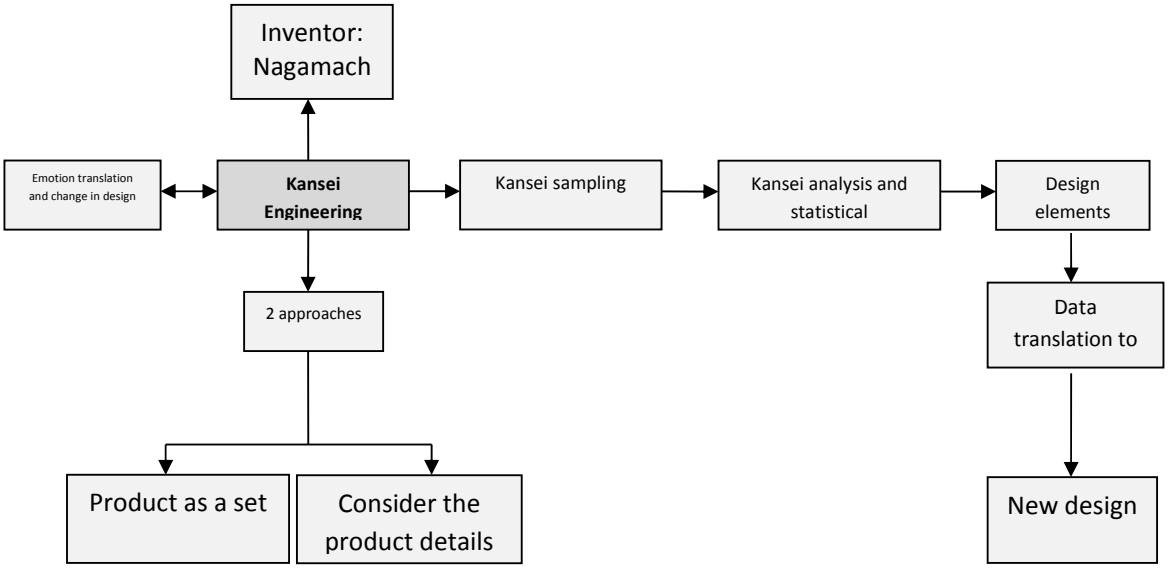

Fig. 3.2. Diagram Kansei Engineering

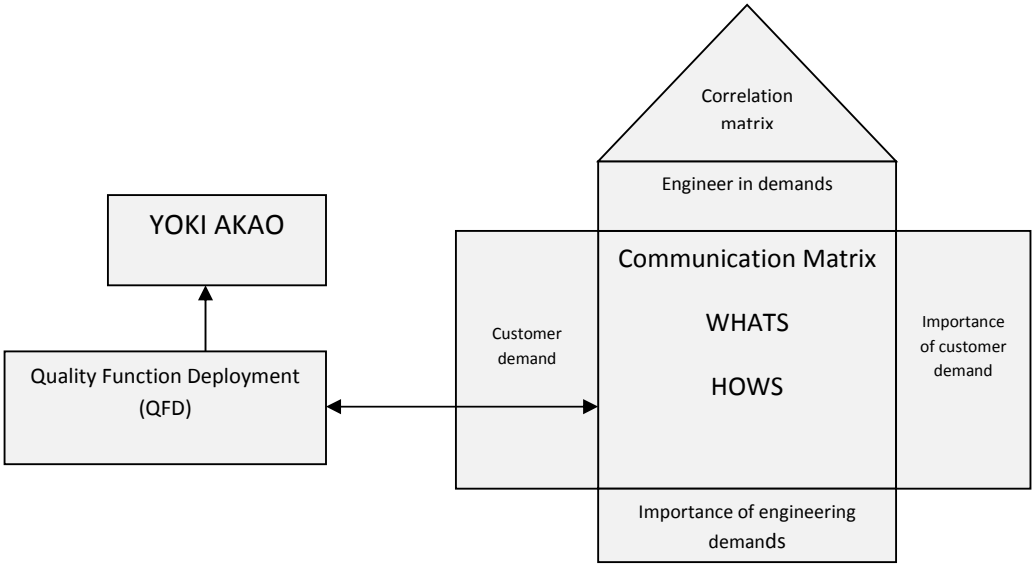

Fig. 3.3. Diagram Quality Function Deployment (QFD)

4. Case Study

Kansei Engineering and Quality Function Deployment (QFD) are utilized in this study to design the play space for children (3 to 6 years old) with an emotional design approach; the reasons for choosing this age group for architectural design are as follows:

Using the user age-appropriate emotional design, we will be able to keep safe the new generation from the challenges in the future and eradicate such these disorders because the sense of curiosity is flourished at these ages, and thus he understands the surrounding environment.

4.1. Sample collection and categorization

In this study, 50 boys and girl children(3-5) are randomly investigated in three different social classes (high-medium-low) and expressed their emotions in this regard by learning the painting techniques concerning their favorite play space design.

5.Finding the Kansei words to find the users' emotions

In this study, the female and male children in different classes are asked to paint the ideal play space in order to identify their emotions, thus they have expressed their feelings, so that we have achieved their ideal spaces with physical and functional features. These terms are extracted from the painted drawings by Kansei Engineering and based on users' domain. The extraction method is as follows:

The master of architecture has extracted the Kansei words in order to better understand the children feelings, so that the useful space can be designed for hyperactive, unsocial and normal children.

A series of psychological items is obtained after analyzing the paintings; they include the words with the maximum meaningfulness and description of children's play space painting. The paintings are classified by cluster method into the following categories.

Similarization, symbolism, dramatic play (flushing the excitement), attention to the color and design, psychological safety, game (memory, motional), attention to the season, tree (round decoration, fruit), interest in water, freedom, interest in jobs.

5.1.Finding the relationships between Kansei emotional and physical words

The correlation of each physical characteristics and Kansei emotional words are measured using the matrix (House of Quality) in QFD, so that the children's emotions are translated and converted into the architectural elements. Each word has a matrix with the columns as the selected spaces and the rows as the characteristics of architectural elements. These mentioned elements are derived from the most ideal play space for children and include the large data as the space characteristic.

Using the extent of correlation between each participant, the correlation of emotional words and physical characteristics are measured for each play space and word. [5]

The selected words of space characteristics are classified into 19 categories by cluster method. This stage is done by SAS software which investigates the correlation between the children's feelings about the play space and studies the ideal architectural elements of this space. (Table 1)

This step is also done based on the calculations and the scores of each space are given according to the physical and functional characteristics, and then the selected space is studied.

Since the correlation between each physical and functional characteristics of space is shown by 0 and 1, the absolute weight of each feature is calculated as follows: In this equation, there is a correlation between the physical feature j and each play space i; the correlation between each word and space i and the number of selected space.

$$Wj=\sum_{i=1}^{n} Widij$$

Table 1. Defined elements for play space

Space features		
	Similarization(boy)	Similarization(girl)
Spatial openness Outdoor Half open space Indoor	17 4 6	23 3 11
Relationship between indoor and outdoor	9	16
Ceiling height and floor difference	3	6
Dynamic lines	8	3
Color Bright Dark	24 3	21 6
Light Natural Artificial	10 2	14 3
In accordance with culture and climate	5	3
Flexible space	8	0
Element	17	7
Spatial diversity	10	4
Texture	9	13
Dynamic space	16	5
Adventure apace (complex)	10	3
Children scale	11	5
Collective play space	10	7
Lonelyplay space	2	2
Natural and quite pristine play space	11	22
Workshop Water Jobs Zoology Sports	7 3 9 3	7 0 11 1
Play Motional Memory	23 4	26 1

5.2. Finding the physical characteristics of product associated with the users' feelings

The determination of target values is among the last stages of completing the quality of house and it is done according to the weights of characteristics and its correlation [6]

6.RESULTS

The survey on the findings indicate that the children's drawings represent the children feelings about the play space has the directly correlation with the feature of architectural elements in the space.

The general study on the color of paintings indicates the children's interest in bright and warm colors and this is similar in all classes, girls, and boys. The male children's more interest in broken lines and the girls' interest in curved lines are significant at various classes. Furthermore, the spatial dynamics can be seen in most of the children ‘splay. The existence of nature in play space cannot be ignored and the boys and especially girls are so attached to nature due to the mental softness.

There is an interest in the presence of creativity in play space and spiral spaces as well as the spatial diversity in boys and girls (especially at lower social classes).

The adherence to Iranian traditions is among the issues which have been more taken into account by girls and boys at lower classes, especially the girls, than others. In terms of spatial openness and open, half open and closed spaces, the open space is more interesting for children and then the half open, and at last the closed space, but it is noteworthy that the children are capable of understanding 3 spaces and it is tangible in their paintings. The girls and boys at high and medium classes are more interested in sitting play(such as PSP, Legg, etc). Perhaps it is due to the greater prosperity and living in apartments in these two classes; the motional plays can be also seen in these three classes.

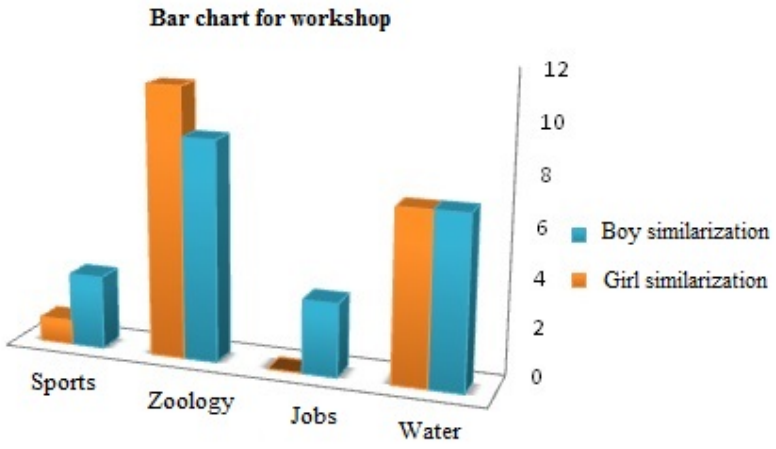

Fig. 6.1. DiagramAnimals, interest in jobs and water

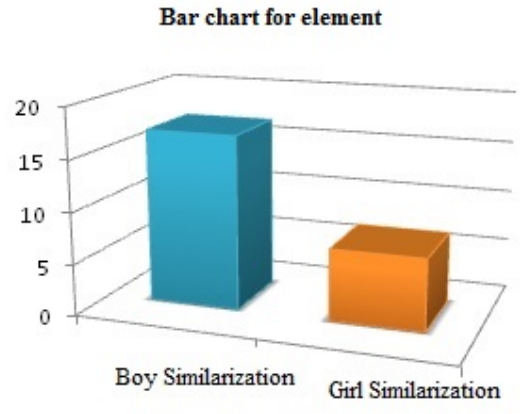

Fig. 6.2.Diagram Symbolism

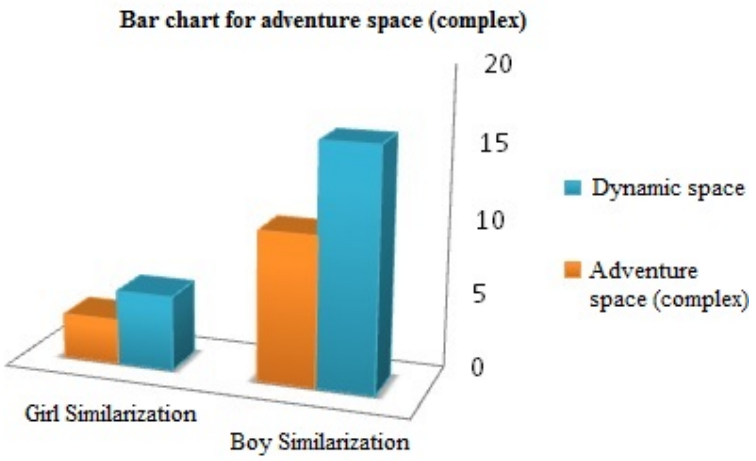

Fig. 6.3.Diagram Dramatic play (flushing the excitement)

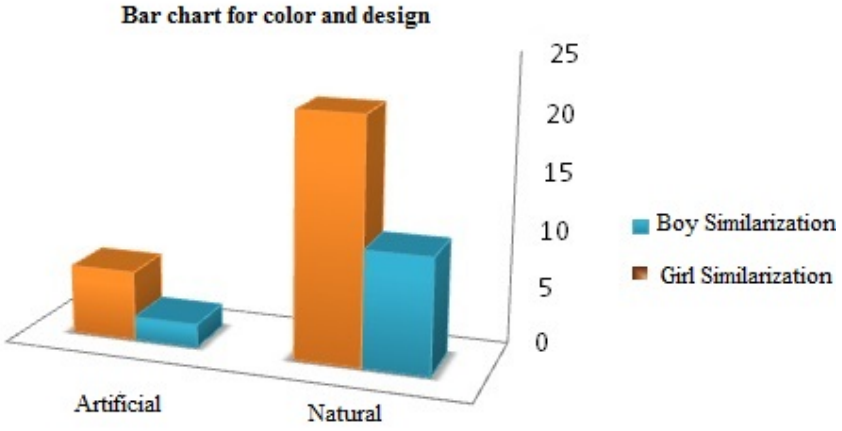

Fig. 6.4.DiagramAttention to the color and design

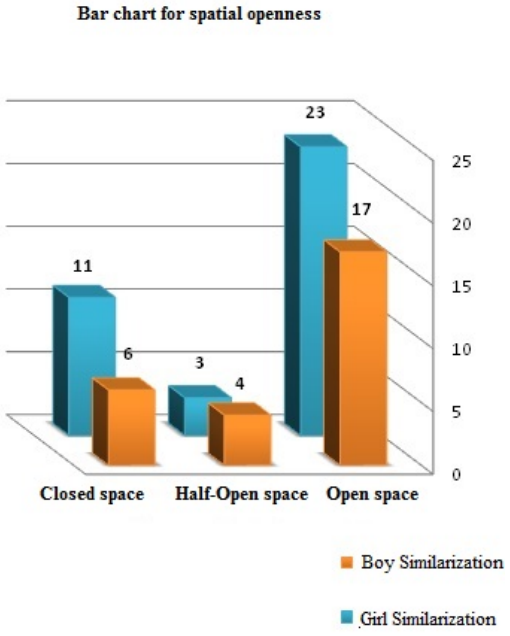

Fig. 6.5. DiagramPsychological safety(bar chart for spatial openness)

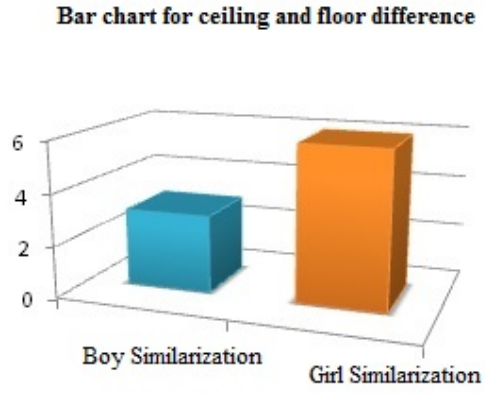

Fig. 6.5.1. DiagramPsychological safety (bar chart for celling and floor difference)

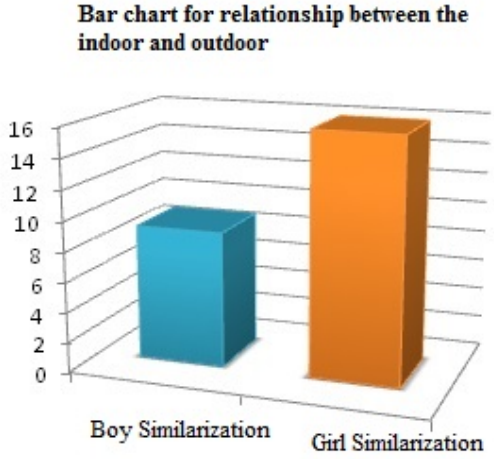

Fig. 6.5.2. DiagramPsychological safety (bar chart for relationship between the indoor and outdoor)

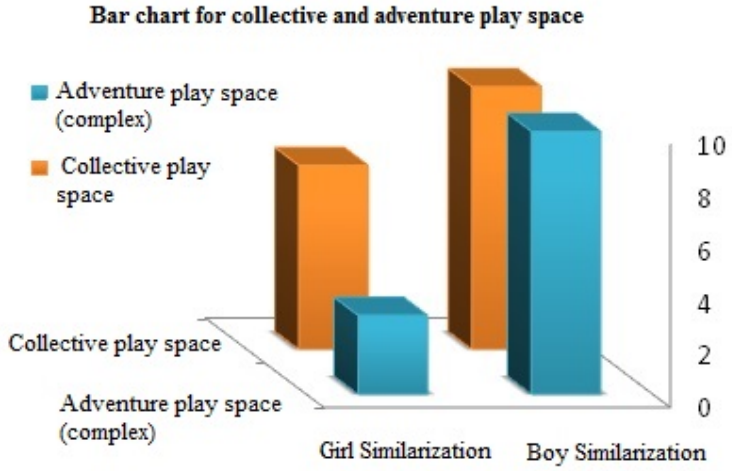

Fig. 6.6. Diagram Memory and motional play

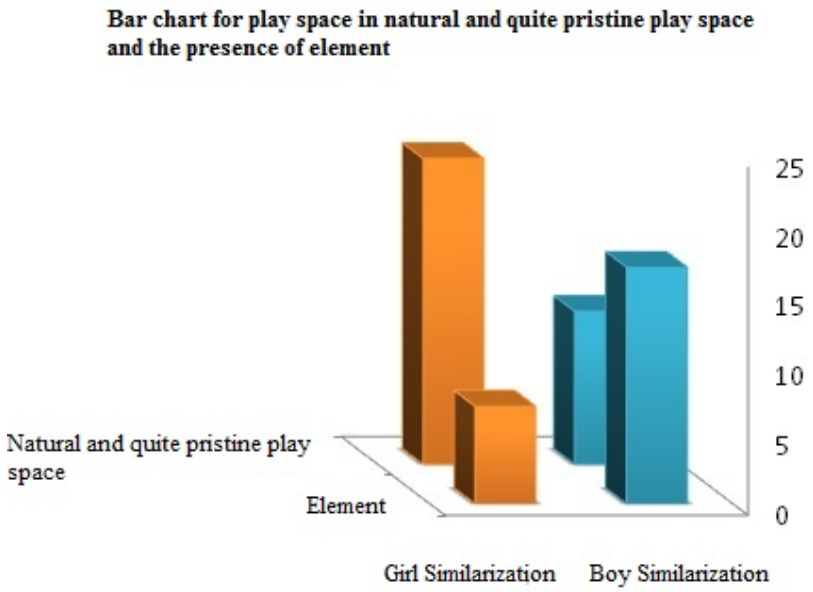

Fig. 6.7. Diagram Round decorative of tree, attention to the seasons:

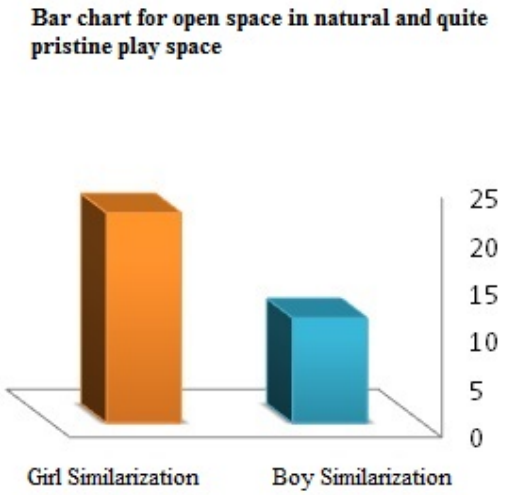

Fig. 6.8. Diagram Sense of freedom

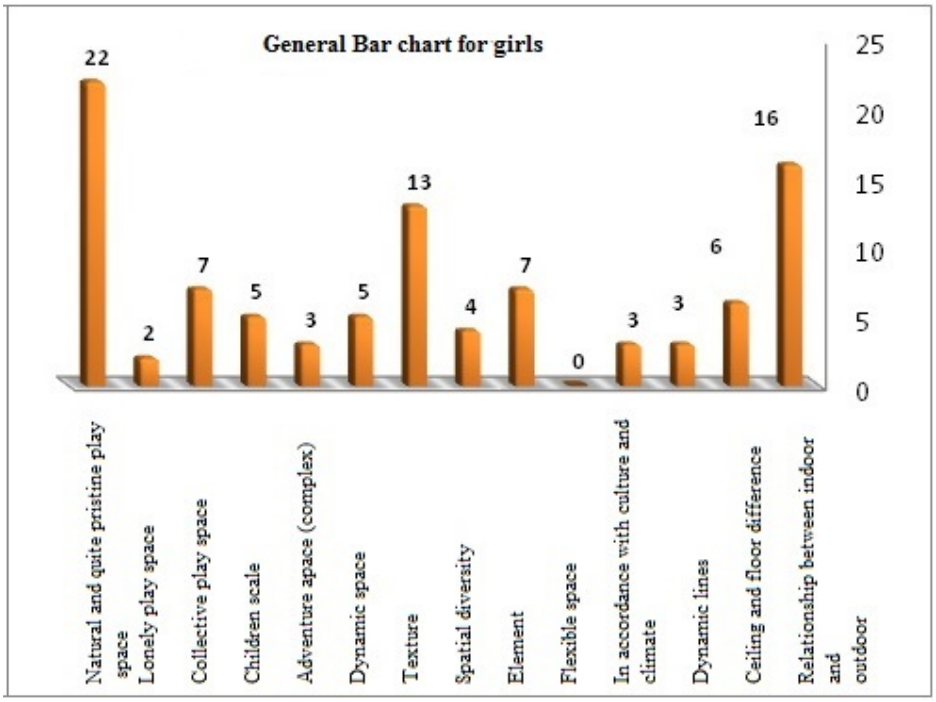

Fig. 6.9. Diagramsimilarzation girls

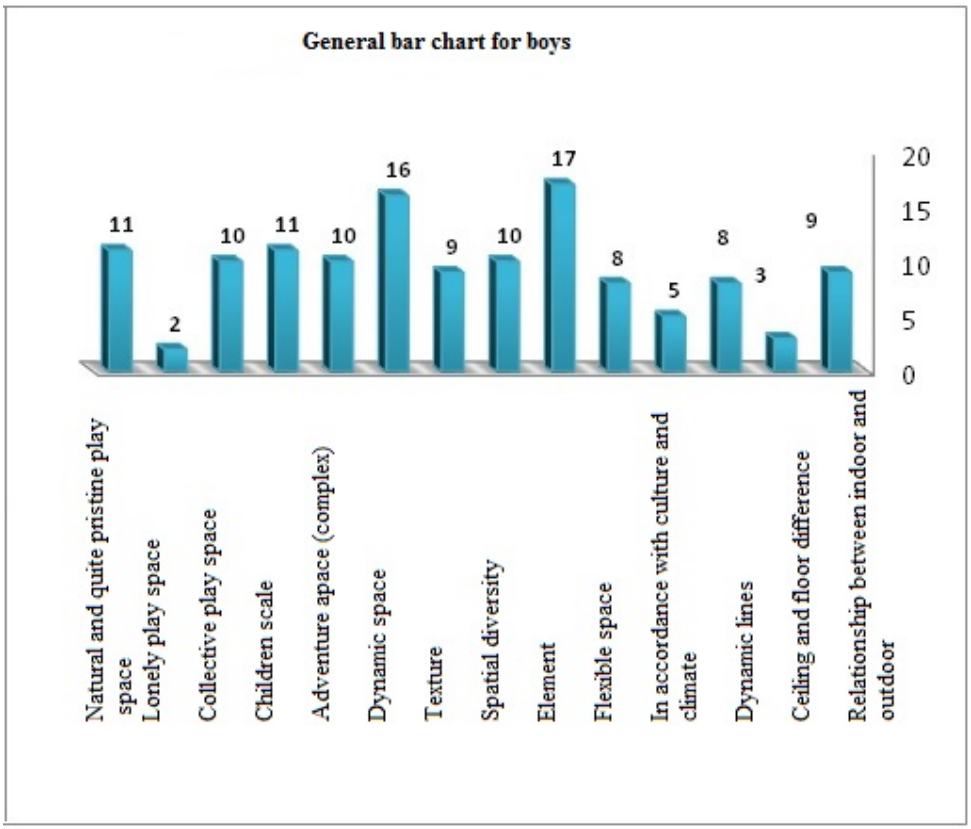

Fig. 6.10. Diagramsimilarzation boys

7.Conclusion

This study aims at translating and converting the users' emotions to existing architectural elements in children's play space and Kansei Engineering is applied to identify the users' emotional characteristics, so that the children are asked to express their feelings by painting, and the qualitative data is converted into the quantitative one by QFD method.

The children needs are extracted from their paintings as the items and translated into the architectural elements in the presence of children psychologist:

The children's interest in animals, jobs and water can be investigated in workshops and also their sense of symbolism and all elements can be easily similarized and it can be fulfilled by the architectural element. The sense of psychological safety can be achieved by utilizing the spatial openness, the relationship between the indoor and outdoor and creating the height difference. The children's interest in nature and various trees can be fulfilled by presence in pristine nature and elements. This research converts the qualitative data into the quantitative one by QFD matrix and obtained scores. In other words, the users' feelings are converted into the architectural elements and the best possible space is considered from the perspective of children.

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