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Cultural color codes in interior

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Abstract

Most of the literature referring to 'color in space', try to define the subject with the basic theory of color and a graphical point of view. It's also necessary to understand the perceptional and semiotic corresponds of color in a space atmosphere. The characteristic of a space is experienced by the user as an atmosphere that surrounds and encloses him. Color is one of the most effective design tools to create an atmosphere in design since its direct relations with sensations. Moreover, color includes some clues that may define universal, cultural and personal expressive meanings within. Designers and architects use color codes as a tool for corresponding a theme or a message to the user. At this point, it's imperative that the color-codes (the meaning) match the space in user's mind. This paper explores the cultural color codes in interior design via two workshops with interior design students which were conducted in two different countries.

Keywords
Color in interior, Color codes, Color semiotics, Workshop.

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1. Introduction

Spaces that we experience, surround us with different effects. The characteristic of a space is experienced by the user as an atmosphere that surrounds and encloses him. Characteristics of a space are clearer and more explicit as the intensity of feelings and emotions we perceive become stronger. Creating an interior atmosphere is made possible through harmonizing thematic elements by employing various design tools i.e spatial organization, fixtures and fittings, color-texture compositions, lighting and materials as well as through environmental determinants as temperature-noise-scent-music and social intercourse.

In the field of interior design, color is one of the most effective tools for creating an atmosphere. As in Adam's definition: "color has inherent design challenges and opportunities since it is the most subjective of all design elements" (2013:159)

Although it is a subjective design element, designer's choice of color may not be explained only by personal preferences. Semantically, color coding is an effective tool for the designer conveying a message or a theme to the space user. These semantic codes may correspond either universal or cultural meanings. Pile refers:

"*The idea that color can transmit meaning, emotional or cognitive messages, has its foundation in two areas. One is the convection that some reactions to color are inborn, intuitive and universal to everyone. The other lies in the body of learned associations that are dependent, in part, on realities that are known to everyone and, in part to meanings that are learned with in a particular time and place.*" (1997:151)

Thus, color should be analysed in terms of in both universal and cultural points of view owing to the fact that it has a direct effect on space user's emotional perceptions.

The presented study deal with universal and cultural color codes in interior design via two workshops including students of interior architecture in Turkey and in the USA.

2. Color as a design tool for a spatial atmosphere

In the field of interior design, 'An atmosphere' may define the characteristics of a space. User perceives spatial atmosphere with his prevailing emotions at a given moment. As Cordan states:

"*Interior space's atmospheric quality may define with being distinctive, memorable, emotional, sense of satisfaction and it's distinguish effects*" (2017:89)

Although designer has lots of design tools to create a space with high atmospheric quality, color may prove one of the most effective tools owing to its direct and swift effect on user's senses. Color was initially approached as a materialistic component, however, it has become more of an atmospheric element following the effects of art movements.

Mindfully using color in a space dates back to late 18th century. Nicolas Le Camus de Mezieres (1771-1789) was one of the first architects to investigate the effects of light, shadow, color and proportion on the human psyche and on the atmosphere of space. In his work "The genius of architecture, or, the analogy of that art with our sensations" dated 1781, he points out synaesthesia for the first time. At the end of the 19th century, color has become totally independent of form and material in space designing. Another conscious interpretation of color belongs to Fritz Schumacher as an architect and a member of Werkbund I. In his article "Colorful Architecture", dated 1901, he points out the mutual influences of color and form (Schultz, Tokarz &Hermann, 2018).

Color has become a compositional element of space for Bauhaus, that defines a space element interacting not only with form but also with time. Influenced by Gestalt psychology, some artist at the Bauhaus (Johannes Itten, Joseph Albers) attempted to study color as a physiological effect independent of culture. Von Doesburg, in his article "The significance of Color in Architecture" dated 1924, explains that the new architecture permits use of color organically as a direct means

of expressing its relationship with in space and time (Schultz, Tokarz &Herrmann, 2018: 48). The role of color in space was a controversial point for designers during the 1920's. A utopian artist and architect, Wenzel Hablik, used color in his constructivist interiors. Although, envelope of buildings were white, colourful interiors were defined as a necessity at that time. Le Courbusier quoted color as one of the basic human needs like water (Schultz, et.al, 2018: 36). Although, he used just white symbolically on exteriors, on the other hand, he chosen to paint the interior walls in bright colours to help make the long, thin spaces appear more generous. He used similar splashes of color and light in many of the buildings he designed later on, as in the Monastery of Sainte Marie de La Tourette (1961) (see fig.1).

Figure 1. *Monastery of Sainte Marie de La Tourette Le Courbusier, 1963 [Url 1].*

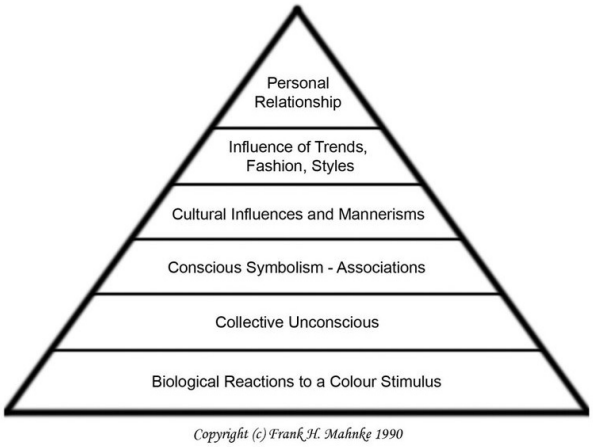


Figure 2. *Mahnke, color pyramid [Url 2].*

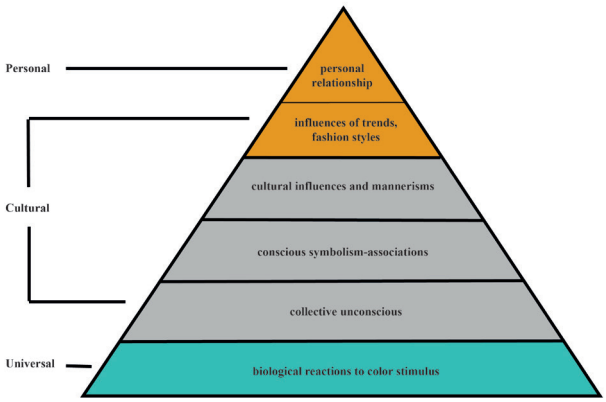


Figure 3. *A comment to Mahnke's pyramid by Dincay, D.*

In early twentieth century, color was regarded as a fundamental sensory experience that also affects architecture. Oscar Putz argued that color is meant to have its own innate effect, and as such, it was assigned a specific task in the context of the building concept (Schultz, Tokarz &Herrmann 2018: 90). Today we may define color as a cryptic language or a code, between the designer and the space user. In creating an interior atmosphere, the designer tries to give a message to the space user thus, the language selected by the designer has to be clear for all users.

Although color is a subjective design element, it also inherits another point of view expressing universal codes. Jasper asserts that color is an important element of design as a universal language (Adam, 2014: 119–123.) Also Michael Pastoureau speaks of color as a multi-layered cultural construct, and refers the fact that over time every society has, in its cultural context, developed its own access to color based on regional possibilities (Schultz, Tokarz &Herrmann 2018).

Today color may be defined to combine all these points of views and perceived both its layers.

2.1. Impact and meaning of color

The perception of color in a space always carry associated effects of symbolic, emotional and physiological effects with it. According to Mahnke, there are many factors working together in this process, partly in conscious and also in unconscious levels of perception. With so many correlations involved, the color experience cannot be definitively systematized or classified. The well-known description of color perception is the "color experience pyramid" of Mahnke (1996:10) (see fig. 2).

According to Mahnke's definition of color experience in the pyramid, the most common effect of color is related to physical impacts in human perception. The collective unconscious, conscious symbolism, cultural effects and subjective effects add to this structure in sequence. Biological reactions and collective conscious form the basis of 'universal color perception' which outlines mankind's entire experience. Cultural characteristics have a major effect on color perception in user's mind. The third level of the pyramid, "Conscious symbolism" shows universal and cultural semantics to define learned responses. There are numerous examples of associations between color and objects and between color and meanings such as 'blue' has with sky and water or 'having the blues' has with sadness. "Cultural influences and mannerisms" are characteristics of specific cultures that also hinge on religions. For example, 'green' has a religious significance in Islam that 'orange' has in Buddhism. "Influence of trends and fashion level" corresponds to a spirit of a particular time. For example, although 'orange' may have a temporary trendy effect in a period of time, it may also have a symbolic correspond as a universal and/or cultural reflection. "Personal relationship level" refers to former individual experiences of a person.

In other words, color transmits meaning as well as emotional or cognitive messages. The meaning of color may be experienced in three focal areas:

- Reactions to color are *universal* for everyone. For example, effects of red and blue may suggest basic human experiences of red with the heat of fire and blue with the cool of water. The emotions reflected by colors presented in the nature are apparent for everyone.
- Learned associations are dependent in part to experiences that are acquired within a particular society in a particular time and place, hence may be called *cultural*. Color implications may vary in every culture. Reflections of colors are learned through the customs of a particular society. There are lots of differences about color implications in different cultures. For example, in western culture 'white' addresses beginnings but on the contrary, in eastern cultures it is preferred for funerals.
- Color may also be related totally on a *personal experience*. For instance, color a favorite childhood toy may carry positive associations for somebody later in life (Pile:151).

As per this approach, Mahnke's "color experience pyramid" may be defined in three basic semantic levels of a new categorization: universal, cultural and personal color perception. (see fig. 3)

3. Case study: 'Habitat of emotions I-II' workshops for interior architecture students

Color is one of the most studied subject at the design field. The literature and various media sources reveal that colors have stereotype meanings. In practical area, many architects have been using the potential of color in his work but with different objectives, and always with different results. On the other hand, in design education generally looks upon color as a scientific theory, and design students are expected to learn about color through a variety of traditional and objective methods (Ertez, Yılmazer, 2009).

At this point, usage of color in interior architecture or conveying a concept theme or a message via color should be made consciously. Since the design education is the first step of learning color, cultural and/or universal meanings of color using are addressed in this study by two workshops. Accordingly, this study tries to explain universal and cultural color codes for interior design students that belong different cultures. The study thus was structured on a universal theme: human feelings and emotions. In this way, the problem would be perceived clearly by all participants. Workshop was planned for defining the differences in color-emotion combination for interior design in various cultures. As both color and emotion have universal codes and meanings, cultural code is the main factor for creating design variations in this study. Also for isolation personal color codes from the results, it was remained to the participants that workshops mentioned experimental spaces.

For the study, two workshops named "Habitat of Emotions I and II", carried

out in Interior Architecture Department of Faculty of Architecture in Istanbul Technical University/ Turkey and Interior Architecture Department of the School of Architecture, Planning and Landscape Architecture in Auburn University/ USA, following the same guidelines.

Goals

There are two main goals for these workshops. One of them is to reveal the relationships between color meanings and culture, the other one is to experience to creating an interior atmosphere with color basically.

The primary aim of the workshops is to compare the color preferences of students of interior architecture, originating from different cultures. Additionally, processes followed throughout the study and results achieved in the end would also show the relationship between emotions and color / form, material, textures in the content of interior atmosphere as subsidiary aim of the study.

Table 1. *Selected emotions, ITU workshop.*

	positive	excitement	happiness	joyful	peaceful	hopeful	
emotions	**negative**	fearful	worry	boredom	sadness	restless	awkwardness

Table 2. *Selected emotions, ITU workshop.*

	Color	**Positive Emotions**	**Negative Emotions**
1	black	excitement	fearful sadness
2	white	Happiness Peaceful joyful	
3	red	excitement	fearful restless
4	yellow	hopeful happiness awkwardness	
5	green	Peaceful hopeful	restless
6	blue	hopeful	sadness
7	purple		awkwardness sadness boredom worry restless

Table 3. *Color using rates, ITU workshop.*

	color	**single**	**with other colors**	**Positive Emotions**	**Negative Emotions**
1	purple	1	3	1	3
2	red		3	1	2
2	yellow		3	3	-
2	green		3	2	1
2	white		3	3	
2	black		3	1	2
3	blue		2	1	1
4	orange		1	1	-

Process

The two "Habitat of Emotions" workshops were conducted using the same guidelines together with 14 students of ITU in May 2018 and 12 students of AU in October 2018. Both workshops were carried out with interior architecture students, who were at the 6th semester of their education.

"Habitat of Emotions" revolved around the idea of creating an experimental interior space that reflects human feelings. Workshops were composed of two parts. In the first part, students created their individual models about a selected emotion and in the second part they were included in collaborative work that was expected to create juxtaposition / transition spaces between specific individual models.

At the beginning of the first part, each student chose a specific emotion from the list. In order to investigate students' matches for emotions and space themes; equal quantities of positive and negative emotions were included in the list. Students prepared a model box with cardboard scaled 1/10 to represent an interior space measured 16'x16'x16' or 5m x 5m x 5m in dimensions. Subsequently, they tried to create some experimental space modules in these model boxes using interior spatial design instruments. Color and texture were defined as the main design instruments for these workshops. The main object of this experimental space modules was to reflect the selected emotion. While creating an emotional experimental inner space, students had to plan introducing the space with selected emotions to the user through transition spaces that are placed before and after the space they designed.

After the individual workshop phase, students started to work with their partners for the transition spaces which were determined through the sequence number of emotions in the list. For this collaborative work, students formed groups of two, tried to design a juxtaposition space between each other's modules. At this point to

discover the relationships between color and context and also between form and material, students were set free to design transition spaces.

3.1. ITU workshop - Habitat of emotions - I

The ITU workshop: Habitat of Emotions I, a day-long study, was executed in Taşkışla Building, with 14 ITU interior design students in May, 2018. Participating students were educated in utilizing color, through spring semester course at ITU. Before the workshop, each student selected an emotion from the list of 20 different emotions. Most preferred emotions were the most complicated and negative ones, so it seemed like a challenge. (see table 1).

After the selection of specific emotions, ITU students spent half a day to select materials they wish to use during the workshop. After preparations, students were allowed 7 hours for total workshop (4 hours for preparing the models, 2 for designing transition spaces and 1 hour for discussion). Colored papers, paints and fabrics were the preferred materials for models. While creating the atmosphere, students thought of it as an experimental space and tried to reflect the emotions that should be felt by the users to the space. Each design needed unique color, material, form and texture decisions for reflecting a specific human feeling to be perceived by space users.

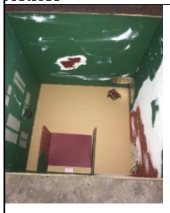
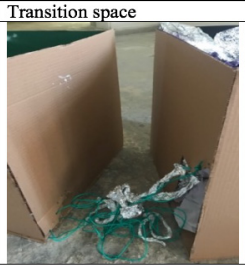
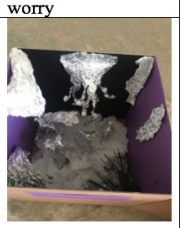
ITU students preferred black, white, red, yellow, green blue and purple colors for different emotions. Most used hue was purple. Purple was perceived to be the strongest hue and used in reflecting four different negative emotions. It used for reflecting awkwardness, boredom, restlessness, sadness and worry. After purple, the secondary preference in color were red, yellow, green, white and black. All these colors were used in equal amount of repetitions in the workshop. and followed by blue and orange. Both blue and orange were each preferred only one time, for reflecting different emotions. Black and white were used with other colors as background. White only matches with positive emotions, on the other hand black was used for both positive

Table 4. *Color scheme classifications, ITU workshop.*

color scheme	colors	emotion	model
NEUTRAL+COLOR	Black Red	Excitement	
	Black Red	fearful	
	White Yellow	happiness	
	Metalic Grey Purple	worry	
	White Orange	joyfull	
MONOCHROMATIC	Purple	boredom	
ANALOGOUS	Black. Blue Purple	sadness	
	White. Green. Blue	peaceful	
	Yellow. Green. Blue	Hopefull	
COMPLEMENTARY	Green purple	restless	
	Yellow. Purple	awkwardness	

[1] *Color scheme: A color scheme is used to describe the overall selection of colors in design.. The major color schemes in design are analogous, complementary, split complementary, triadic, rectangular and monochromatic. These color schemes utilize colors at certain locations on the color wheel. (Gage,2000).*

Table 5. *Transition space examples, ITU workshop.*

sadness	Transition space	happiness
		
restless	Transition space	worry
		

and negative emotions, by ITU students. (see table 2).

Students used colors due to universal meanings to reflect some specific emotions. Some feelings were reflected only by a single color whereas some of them were used in a combination. (see table 3) Since ITU students had a basic knowledge about color in space, they were able to make these combination by using *color scheme*[1] methods, easily. (see table 4). When examining with color scheme classifications:

The *Monochromatic Scheme*, was preferred only once, for reflecting 'boredom' with 'purple'. Students used colors with black-white or other hues for other emotions. Red, yellow and purple used in *Neutral +color combinations* for some positive and negative feelings (excitement, fear, happiness and worry). Sadness, fear and hope were defined with *Analog Color Shemes.* Restlessness and awkwardness were reflected through contrasting colors. Students used *Complementary Color Sheme* for these two feelings.

After individual working phase, students started to work with their partners for the transition spaces between the boxes. This phase was helpful for discovering the relationships between color-context and form-material. At this point, students created a hub as an input and also an output space for main emotion space. The most challenging juxtaposition points were the ones located between positive and negative emotions. Students reflected sharp feeling changes utilizing different space proportions or materials, rather than color in these hubs. (see table 5).

Table 6. *Selected emotions, AU workshop.*

	Pos.	excitement	joyful	happiness	peaceful	suprise		
emotions	**Neg.**	awkwardness	worry	boredom	sadness	restless	lonely	impressed

Table 7. *Selected emotions, AU workshop.*

	Color	**Positive Emotion**	**Negative Emotion**
1	black		Draggy Worry Sad Restless Worry
2	white	Surprise Excited Happiness	Sad Draggy Lonely
3	red		Angry Impressed Restless Worry
4	yellow	Surprise Happiness Excited	
5	green	Surprise Excited Restful Joyful	Impressed
6	blue	Surprise Excited Restful	Sad
7	purple	Restful	
8	orange	Surprise Excited	Restless
7	pink	Surprise Excited Joyful	

Table 8. *Color using rates, AU workshop.*

	color	**single**	**In a color combination**	**Positive Emotions**	**Negative Emotions**
1	white	1	5	2	3
2	black		5	-	5
2	green		5	4	1
3	blue		4	3	1
4	orange		3	2	1
4	pink		3	3	-
5	purple		1	1	-

3.2. AU workshop - Habitat of emotions - II

Meanwhile the identical experiment at Auburn University School of Architecture, Planning &Landscape Architecture, completed in October 2018 was named Habitat of Emotions II. As had been with the first one, 12 interior architecture students from the 3th grades, joined in this workshop. The major excursion between two student groups was about knowledge of color in space. Rather than ITU group, Auburn students hadn't taken any courses based on color until this workshop.

First of all, each student selected an emotion from the same list (see table 6). At this point, there were 4 different emotions in Auburn students' list. After the selection, same as it was in the first workshop, students initially created their own model space which was reflected selected emotions firstly and then they designed transaction spaces with their partners.

In Habitat of Emotions II, Auburn students were allowed 5 hours for total workshop (3 hours for the models, 1 for designing transition spaces and 1 hour for discussion). To compensate for the short amount of time, Auburn students were allowed to use some materials already prepared by tutors before the workshop. Colored and textured papers and paints, were the

basic materials for their individually prepared models. Majority of Auburn students preferred using materials that had been given to them before the workshop, and some of them created their own colored material compositions with different materials. They used black and white as backgrounds, as observed in ITU workshop. Orange and also pink were used by Auburn Students (see table 7&8). Most preferred hue was black and the least popular one was purple.

Chosen methodology for working by AU students in *Habitat of Emotions II,* might define as collocated some colors together rather than making an informed combination. AU students made some combinations in their models as per their personal choices and graphic views, since they hadn't attended a specific course yet, about using 'color in space'. Even so, students made some matches according to their general knowledge about meanings of colors.

Table 9 shows applied color combinations by both ITU and AU Students in *Habitat of Emotions Workshop_I-II.* as a comparative analysis.

In the second phase of *Habitat of Emotions Workshop_II,* Auburn students worked as a team to create an interior spatial atmosphere for "buffer zones (transition spaces). Students focused on creating a spatial transition between two emotional spaces. The common approach of the AU students about buffer zones were thinking these spaces as preliminary areas for the next emotion spaces (see table 10). That's why they used the same materials which used in basic emotion model but in different forms. Owing to lack of time, most of the teams couldn't finish the design of transition spaces on time. As a result, only 3 transition space models were completed at the end of the AU Workshop.

4. Discussions and results

This study tries to reveal cultural color codes in interior design via two workshops which implemented with interior architecture students in AU, USA and ITU, Turkey. The role of the students' may be defined as designers and representors of their own culture in these workshops.

Table 9. *Comparative analysis of Workshop I and II for color preferences of students.*

EMOTION	USED COLORS_ ITU	WORKSHOP ITU	USED COLORS_ AU	WORKSHOP AU
Excitement	Black Red (neutral +color)		White Green Orange Blue	
Fearful	Black Red (neutral +color)			
Happiness	White Yellow (neutral+color)		White Yellow (neutral+color)	
Worry	Metalic Grey Purple (neutral+color)		Metalic Grey Black Red (neutral+color)	
Joyful	White Orange (neutral+color)		Green Pink (complementary)	
Boredom-Draggy	Purple (mono- chromatic		White (neutral)	
Sadness	Black Blue Purple (analogous)		Black White Blue (neutral+color)	
Peaceful	White Green Blue (analogous)		Green Blue Purple (analogous)	
Hopeful	Yellow Green Blue (analogous)			
Awkwardness	Yellow Purple (complementary)			
Angry			Red Metalic Grey (neutral+color)	
Surprised			White Pink- Green Orange -Blue (tetrad)	
Lonely			White Neutral	

Table 10. *Transition space examples, AU workshop.*

impressed	Transition space	restless
		
restless	**Transition space**	**happiness**
		

All students who attended the *Habitat of Emotions Workshops I and II* were 3th grade students. The two groups had unequal experiences in their education, AU students hadn't been taken a course about color in space at the time the workshop was carried out. Because of this, it has not been possible to compare final works in terms of technics for color schemes, but a comparison was possible in approaches of cultural color choices.

This study also pointed out the design treatments of two student groups. Major differences were observed in creating space atmospheres. ITU students took the concept as an experience of space and so, majority of ITU students used color on surfaces. On the other hand, AU students paid attention also to the function of the spaces and designed their models with some fittings.

In terms of universal meanings of color, some matches between color and emotions are observed to be in the same way in two workshops, such as yellow and happiness, blue and sadness, green and peace. At this point it wouldn't be wrong to assert that yellow, blue and green point out same universal meanings admitted by both Turkish and American students. But unlike yellow, blue and green used with in some color combinations.

Black and white were used for backgrounds in both workshops. While white was matched only with positive emotions in ITU (happiness, joy and peace) it was used for both positive and negative emotions in AU workshop (loneliness and draggy / happiness and excitement). black translated only negative meanings for AU students, in contrast, it covered both positive and negative meanings (excitement and fear) for ITU students.

Since AU students haven't taken a course about 'color in space' until the workshop, they created color combinations with instinctive methodologies or with in their general knowledge about color. But it was quite important since this approach gave some ideas about the symbolic meaning of colors in overall American culture. It was seemed that positive emotions were reflected by multi-colors and negative ones mostly were without colors for AU students.

Some model spaces were created only with a single color in both workshops. It was expressed that some feelings had clear symbolic color reflections in students' minds and also in their own culture. These color were:

Red, yellow, purple for ITU and white, red, yellow for AU students.

Surprisingly red, as a basic color, was matched only with negative emotions for AU, but it was used for both positive and negative meanings by ITU students.

The most remarkable color for in both two workshops was yellow, since, even if it was used in a combination or just singly, yellow only reminded positive emotions both for AU and ITU students. And specifically matching up of '*yellow and happiness*' was the only joint approach in these two workshops.

The other remarkable color was purple in this study. Surprisingly purple, was the most preferred color in AU, but least referred one in ITU workshop. Purple was preferred for its negative and passive reflections in ITU workshop (sadness-boredom-awkwardness) on the other hand it is matched with a positive emotion (peace) in AU workshop.

The transitions between emotions are also moments where personal proclivities require adjustment, although each box was not completed by that point in the AU workshop.

5. Conclusion

Habitat of Emotions Workshops I and II, gave both student groups chances to gain experience about use of color in space. Some differences about symbolic meanings in colors and emotions reflected by colors were observed at the two workshops, despite both student groups describe themselves as members of the western culture and vast cultural transactions between two countries.

In a general point of view, color has a major role for creating an emotional experience space atmosphere because of the codes it has. When it comes to create an emotional atmosphere, some feelings need to expressed with a few color together. Basic differentiate in two workshops may express with these

reunions.

The most striking match was '*yellow-happiness*' in two workshops. It may say that just yellow has a strong universal color code that dominates cultural one. Except yellow, all colors matched different emotions or used with different colors to express that emotions.

As an auto critic, students couldn't find an opportunity to see or discuss the solutions of the other workshop. To complete this study, solutions of both workshops will be presented and shared in lectures to the students in both universities.

As a last word, in today's global world, majority of countries have clear cultural transactions between each other. Popular culture became more widespread through media, fashion, music etc. A local cultural life and its conceptions do persist in many countries even in this global communications age. Explanation of color is one of the most powerful indicators of local culture. Attribute in a meaning to a color and matching it with some basic emotions can only be understood with a thorough analysis local the culture including the common background and religion.

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