

This into
consideration
functional, social and
aesthetical

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This study is concerned with colour and texture preference of exterior architecture in desert environment with application on Sultanate of Oman. With regard to the most preferred colour, six beige variations were assessed by Omani undergraduate ladies. These are varied in hue, saturation and brightness. This is because it was noticed that almost beige variations are used in traditional and contemporary Omani exterior architecture. These colours were ordered from the most preferred to the least as follows: cosmic latte ? Tuscan? unbleached silk? cream? Buff? Ecru. In the texture investigation, the low degrees of roughness were preferred rather than smooth and high roughness levels. Cosmic latte of low roughness was found the most preferred exterior buildings' colour and texture in desert environment and especially Sultanate of Oman.

It is suggested that these results could be taken into consideration by architects and urban designers. Extending investigations concerned with desert environment with focus on Sultanate of Oman is recommended. Adoption, exploitation and application of this research findings is suggested for organizations and institutions concerned with developing and establishing housing and construction. This is to fulfil aesthetic, functional and economical values of exterior architecture.

Architecture is the art and science of designing buildings and structures (Merriam-Webster. com, 2016). This would include a large variety of constructions ranging from urban planning to furniture design. This includes planning, designing and constructing form or space taking into consideration functional, social and aesthetic aspects and values.

Aesthetic values in architecture such as variety, equilibrium, repetition, <https://assignbuster.com/this-into-consideration-functional-social-and-aesthetic/>

harmony and expressiveness are fulfilled using basic design elements including contrast, proportion, scale, balance, rhythm, unity and character.

Formal aesthetic elements include form, colour and texture. Colour researchers are interested in gaining better understanding of interrelations of these elements in order to enhance architecture design process (Anter & Billger, 2010). Colour is one of the most important architecture aesthetic elements that could achieve several architectural requirements. It could link building and environment (Serra, 2013a). Texture has a great impact on colour appearance and visual quality. It would exist with variable levels from soft to rough. Caivano, J.

reviewed research studies focused on colour in architecture and environmental design from ancient times to 2006. He reported that material aspects were the focus of colour in architectural research studies. In the 19th century, studies were characterized for descriptivity and objectivity. In the 20th century, researches were either concerned with colour scientifically or rhetorically. He suggested that architects would be better to interrelate colour science and art in the architecture field (Caivano, 2006).

Smith, D. in 2008 introduced a theoretical concept for designers regarding colour-person-environment relationship. This is including urban design, landscape architecture, and industrial design, as well as architecture and interior design. She indicated that colour assists understanding a place. A person in this relationship is viewer, participant and immersed. She showed that colour is a key component of person.

It was reported that the designers should consider how the designed objects or places can influence how people experience their daily activities (Smith, 2008). Cubukcu and Kahraman compared building exterior colour preference of Turkish architects and non-architects. One building was chosen and coloured using variations of hue, saturations and lightness. They found that yellow and blue are the most liked colours. Moreover, architects and non-architects differed in their colour preference. Participants highly preferred colours of full brightness and moderate to low saturation and colours of moderate to high brightness and full saturation (Cubukcu & Kahraman, 2008). Anter and Billger discussed different approaches of colour research in architectural.

They reported that research studies related to colour appearance and emotion are independent of each other. Colour research in the architecture area is linked to its real situation. Therefore, it is impossible to accurately generalise these studies' results but could be used to extrapolate colour tendency and directions. Results of studies based on different approaches and methodologies could not be compared or combined but could assist analysing and addressing architecture problems, questions and patterns (Anter & Billger, 2010). Serra et al. in 2012 studied colour composition in modern architecture. They carried out a comparative study of three of the most relevant colour composition systems in the first half of the 20th century (Purism and Le Corbusier, Expressionism and Taut, Neoplasticism and Rietveld).

Three widespread ideas were investigated. These were the prominence of whitehues, the use of "flat colours," and the conception of colour during the ideationphase. They concluded that the three systems limited the range of colour toavoid "colour excesses" of the painted decoration, and debug form. Therewas tendency to reduce shades but not so usual.

Colour was used to transformarchitecture rather than conforming to it. There was ethical basis in choosingcolour in addition to aesthetical concerns.

Architects were concerned withvalues beyond ethical and aesthetical values. These were political, economic, hedonistic, communicative values (Serra, García, Torres, & Llopis, 2012). Later in 2013, Serra and Codoner analysed the colour compositionfeatures in postmodern western architecture (1960-2000). This was to helpunderstand the roots of contemporary colours used in architecture.

The mainfeatures of four decades (60's, 70's, 80's and 90's) were analysed. In the60's, two main trends were reported; namely ecological and technologicalutopias. In the 70's, they pointed out different chromatic trends used byneo-rationalist architects.

In the 80's, architects used semantic values ofcolour to bring high architecture to common public. In the 90's, there was thedevelopment of computer aided media and colouring technologies of materials. This led architects to be deconstructivist exhausting colour possibilities inarchitecture (Serra & Codoñer, 2014). Serra, J. discussed the versatility of colour in contemporaryarchitecture aiming at establishing concepts of the way colour was employed. Four concepts related to "versatility" were set. These are

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transformation, fragmentation, movement, and novelty. Transformation affects the visual aspect of the building.

Fragmentation affects the unity of the building. Movement affects the position as architects either use static colours suggesting movements or actual moving colours. Novelty applies the use of technology in applying and choosing colours used. He indicated that colour versatility in the future should not be isolated from its environment context (Serra, 2013b). Later in 2013, he analysed the architectural colour classification systems suggested by previous researchers and reported three main plastic strategies.

He considered these systems as complementary rather than contradictory. These were that colour can describe a building and its function. It can affect a building's architectural shape.

Besides, colour is arranged for its intrinsic value. The most interesting successful colour composition is the one integrating the three systems or strategies (Serra, 2013a). Previous research studies indicated that building is linked to environment. This is because there are mutual interrelations between architecture, environment and human.

Each environment has its significant features affecting architecture design. Desert environment is a special environment signified for its geographical nature and climate conditions. This requires designing appropriate architecture fulfil aesthetic and functional values. This study is concerned with aesthetic aspects of architecture in desert environment of Sultanate of

Oman. Research studies investigating desert environment of Sultanate of Oman were reviewed. There were found limited studies.

One of these studies is a study carried out by Hegazy, S. found that 77.4% of the respondents in her study satisfied with contemporary vernacular architecture in Sultanate of Oman. This is because of using inherited traditional Omani style. The research recommended extending investigations in Oman concerning a wide range of using more abstracted forms of Omani traditional architecture, and more tendencies to develop the use of eco-friendly materials (Hegazy, 2015). The author found that the literature review lacking knowledge related to spatially complex situations of desert architecture and specially Sultanate of Oman.

It was found important to investigate aesthetical values of architecture in Sultanate of Oman with special focus on colour and texture. This is to fulfil aesthetic unity in the city which affect positively the surrounding environment and consequently on human living in this environment. This study aimed at determining the most preferred colours and textures of architecture in Muscat as a desert environment. This is because they are very important architectural aesthetic and functional values. This study objective is to present the results to organizations and constitutions work on housing and construction to be adopted in developing architecture design of Muscat-Sultanate of Oman. 1.

Method 1. 1. Subjects Research studies showed that there are several factors in psychophysical experiments would be assessor dependent.

These factors include age, gender and cultural and educational background. Therefore, it was decided to use 50 Omani ladies studying in the final year- graphic design department. 1. 2. Stimuli This study is concerned with architecture in desert environment with focus on the Omani environment. A building of contemporary Omani style was selected from Al Mouj city- Muscat. The picture of this building is used as the main sample in the experiments conducted.

In this study, two experiments were carried out. The first experiment is concerned with colour and the second is focused on texture. 1.

3. Experiments 1. 3. 1. Studying the color of Omani architecture It was noticed that variety of beige colours is being used in the exterior architecture in Oman. Therefore, it was decided to choose six different variations of beige almost used.

The picture of the building set as the main sample was coloured into those six beige variations using Photoshop software employing the HSV color model (see Figure 1). The Hue (H), Saturation (S) and Value (V) values used in this experiment are listed in Table 1. Table 1 Hue(H), Saturation (S) and Value (V) values of colours used

Colours	Hue (H)	Saturation (S)	Value (V)
Cosmic latte	40°	94%	90%
Cream	57°	18%	100%
Unbleached silk	22°	21%	100%
Tuscan	35°	34%	98%
Buff	49°	46%	94%
Ecru	45°	34%	76%

1. 3. 2. Studying the texture of Omani architecture The texture of building exterior is highly affecting its appearance. Therefore, it was decided to make variations of texture for the most preferred colour.

This was carried out using Photoshop software employing “Texturizer” filter-“Craquelure” subfilter. This subfilter simulates the cracking of the paint. In “Craquelure” subfilter spacing, depth, and brightness could be set. The default values of spacing and brightness (i. e. 10) were used.

Six depth values were applied in order to produce variety of textures for the same colour found preferred by the subjects. These are 0, 2, 4, 6, 8 and 10. (See Figure 2) Value of zero is used to present the smoothest texture; however, the value 10 was used to present the roughest texture. In each of the previous experiments, the paired comparison method was used to determine the most preferred colour or texture. The number of samples (n) in each experiment is 6. Therefore, in each test there will be $n(n-1)/2$ pairs to be compared (i. e.

15 pairs). Each pair is shown to the participant to choose the preferred one.

2. Results and discussion
2. 1. Assessment of Omani architecture color
Six pictures coloured in the six beige variations (see Figure 1 and Table 1) were exhibited to the 50 participants in pairs to choose the preferred one. The results are shown in Figure 3. From Figure 3, it was found that cosmic latte is the most preferred beige for exterior buildings in Oman followed by Tuscan, unbleached silk, cream, Buff and Ecrú is the least preferred beige.

The values of Hue, saturation and value of the most and least preferred colours were compared. With regard to hue, the colours assessed were found ranging from 22° to 57° (HSV system). Both colours (i.

e. the most and least preferred) were found in the middle of this range (Cosmic latte 40° and Ecrú 45°). The most preferred colour "cosmic latte" was found the most saturated beige assessed of 94%. However, the least preferred colour "Ecrú" was found of significantly lower saturation (i.

e. 34%). With regard to value, beige variations assessed were found ranging from 100% to 76%. Ecrú value was found in the least end of this range.

However, cosmic latte value was found in the middle of this range of 90%. 2.

2. Assessment of Omani architecture texture From the previous experiment, cosmic latte was found the most preferred beige.

Therefore, the picture of building coloured in cosmic latte was used in this experiment employing 6 texture variations. These texture variations were used to produce 6 pictures of the building exterior of different textures (see Figure 2). The pictures were shown to 50 participants in pairs to select the preferred ones. The data collected were used to order rank the texture variations used preference from the most to the least.

The results are shown in Figure 4. It is stated in section 2.3.2 that the Craquelure subfilter was used to make 6 different pictures of different textures. This was carried out employing different depth degrees.

In this subfilter, the higher value of depth was, the more rough the paint of building exterior was. From Figure 4, the pictures assessed for texture were rank ordered as follows: 2? 4? 0? 6? 8? 10 depth. This means that the subjects preferred low and medium levels of roughness (presented here by 2 and 4 depth) rather than smooth and highly rough levels. 1. Conclusions

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and implications. In this study, colour and texture preference of exterior architecture in Sultanate of Oman were investigated. 50 Omani ladies studying in the final year - Graphic design department were employed to carry out subjective assessment.

Two experiments were conducted (i. e. colour and texture assessments). The samples used were 6 pictures in each assessment. The first experiment was focused on the colour preference of building exterior and the second was concerned with texture. In the colour assessment, beige variations were used to colour a building presenting contemporary Omani architecture. These beige variations were order ranked from the most preferred to the least as follows: cosmic latte? Tuscan? unbleached silk? cream? Buff? Ecrú. In the texture investigation, the low degrees of roughness were preferred rather than smooth and high roughness levels.

It was concluded in this study that cosmic latte of low roughness could be the most preferred exterior buildings' colour and texture in desert environment and especially Sultanate of Oman. These results have practical and economic implications for urban and architects designers. This is because effective exploitation and application of colour and texture in exterior architecture could be reflected in its aesthetic, functional and economic values.