



THE DAZZLING IN ISLAMIC ARCHITECTURE

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ARTICLE INFO

Volume: 8

Issue: 1

Page: 234-243

Received: September 18th, 2023

Accepted: January 4th, 2024

Available Online: June 20th, 2024

DOI:

<http://dx.doi.org/10.18860/jia.v8i1.23594>

ABSTRACT

Buildings in Islamic architecture are distinguished by dazzling features in general, especially religious buildings such as mosques, schools, and shrines. The literature could not find a clear identification of reaching the dazzling concept. Moreover, researchers in the Islamic architecture discipline did not focus on determining sufficient knowledge of the design methods of applying the dazzling approach in Islamic architecture, and they did not clarify a specific detailed vocabulary of Islamic dazzling concepts. However, the problem of the study was identified by observing the literature and buildings. Therefore, the formulated question encompasses "the unclear knowledge of applying designing procedure of dazzling characteristics in Islamic Architecture buildings." The study raised an important question: "What is the design methodology of dazzling features in religious buildings within Islamic Architecture." The study aims to identify the practical design elements, principles, and rules of the dazzling characteristics in religious buildings in Islamic architecture to draw out a guideline that designers can apply in contemporary Islamic Architecture. The theoretical framework of the dazzling concept was constructed to achieve this aim, with variables and sub-variables highlighted to identify the design methodology that can actualize dazzling concept in Islamic architecture by reviewing previous studies. The abstracted variables used in designing the checklist were applied to analyze the cases formally. Selecting cases from religious buildings from Islamic style depends on specific criteria. However, the results analyzed statically showed that dazzling concept in Islamic architecture applied in five major levels (structure, form, architectural elements, interior space, and ornamentation) with seven main principles (richness, exaggeration, uniqueness, complexity, proportion, and ambiguity). Richness is the most affected factor in applying clear dazzling concept, while exaggeration and uniqueness are second-rated factors that can impact the value. Dazzling concept is an essential characteristic that designers should apply in contemporary Islamic architecture.

Keywords:

Architecture Design; Islamic Architecture; Religious Buildings; Perception

1. INTRODUCTION

Dazzling in architecture is one of the designs' goals to create an impact on the recipients due to distinguishing buildings depending on a set of architectural characteristics, such as exaggerating the size or strange and unique form. The new and valuable materials are one of the factors in achieving dazzling.

Various Architectural styles in the contemporary world and ancient era were distinguished by their architectural production, which influenced the recipients by including dazzling characteristics, such as Mesopotamia architecture in various periods (Assyrian and Babylonian). The Mega buildings such as Ziggurats are known for their exaggeration in height and shape. These kinds of buildings are likely and mostly seen in ancient Egyptian architecture, dazzled the recipients with the mega pyramids. Moreover, Greek and Roman architecture applied the dazzling characteristics in the monumental temples using durability marble within specific rules and methods [1], [2]. Islamic architecture was distinguished within different periods with a high ability to dazzle the

recipient, especially in religious buildings such as mosques, schools, and shrines, characterized by dazzling elements such as tall and multiple minarets and vast domes. The dazzling features are actualized through size, variety of shapes, monumental entrances, and exaggeration. [3]. Moreover, the unique decorating and structure elements such as ‘Muqarnas’ enhanced the dazzling concept [4], [5]. The type of religious buildings, such as Mosques, can be classified according to form, size, geometry, elements, style, and size [6], which are the main factors that can enhance the dazzling features in Islamic architecture.

The study is a trail to solve the problem of the unclear knowledge of applying designing procedures of dazzling characteristics in Islamic Architecture buildings due to the shortage of literature. Therefore, to solve the problems of the study, the question proposed was, “What is the design methodology of dazzling features in the religious building within Islamic Architecture?”. The study attempts to identify the practical design elements, principles, and rules of the dazzling characteristics to draw out a guideline that designers can apply in contemporary Islamic Architecture. Moreover, it tries to discover the most common method used in Islamic Architecture to create dazzling features by analyzing the selected samples of religious buildings in Islamic architecture from various regions and geographical areas.

The study depends on identifying the practical definition of the dazzling concept in architectural design in general and Islamic architecture in particular, using previous studies in this field to build a theoretical framework to isolate specific variables for creating dazzling features in Islamic architecture. After that, this framework was applied in a practical and analytical study on a group of selected Islamic architectural models according to specific criteria, which the architectural studies and specialists agreed on, about how these models are being distinguished by the dazzling characteristic.

The definition of dazzling, according to the Oxford Dictionary, is an adjective for something so bright as to blind someone temporarily, which can reflect attractive, impressive, brilliant, unique, and amazing feelings [7]. Dazzling is a word for brilliantly, showily bright, or colorful, linked to the beautiful display. The researchers used the term primarily to describe the way of using details in the overall design, such as glass, materials, objects, colors, or other physical characteristics of the buildings. O’Gorman and Spuybroek mentioned that dazzling element is an element of sympathy and configuration design system, which can be reflected by the strangeness factor perceived by humans [8]. The Marble Palace in New York is described as an example of Dazzling architecture, including size, furnishings, and displays because it uses a marble exterior and plate glass display windows. Moreover, the feature of interior design such as columns, the dome, the double volume area, and the circular staircase represents dazzling architecture due to the use of new materials and architectural features at that time, which was considered a strange and unique design. Some researchers linked the dazzling features with the design ideas, which led to the production of unique and creative buildings [3]. Using unity in utilizing materials such as marble in old Mosul City, especially in the framing of windows and doors, created creativity and dazzled the recipients [9]. Hudson discussed the dazzling architecture term by reflecting on the principles of size and massive structure used to design Burj Khalifa in Dubai as the World’s Tallest Tower’s Dazzling Architecture at that time [10].

Hamed and Ali highlighted that the interaction between architecture and structure can create dazzling features, one of the designers’ aims in contemporary study [11]. The dazzling features included various levels to reflect novelty, complexity, incompatibility, and ambiguity characteristics, which can be used at specific rates. The dazzling features may lead the recipients to a group of inquiries linked to excitement and attraction because of the strangeness, unusualness, and unfamiliarness in the contexts and organization of the building structures. A set of strategies to create dazzling architecture depends on the structure, encompassing “high-tech”, the use of transparency, exaggeration, sudden transformation, and symbolism [11][12].



Figure 1. Yazd Mosque Portal as an example of exaggeration in architectural elements [15], P2.

Murad mentioned that the minaret in Islamic architecture is the most important architectural element to create dazzling features, a type of representation and creativity system in Islamic architecture because of the vertical direction and the exaggeration in size. Moreover, the portal in the Mosques in central Asia used Minarets on one or both sides of the entrance wall, increasing dazzling value (Figure 1). The researcher mentioned that dazzling principles existed in the Islamic palaces through the characteristics of the monumental structure [5]. Moreover, the minarets, domes, Muqarnas Vaulting, Arches, and Decorative details are used as distinctive Elements [4]. The monumental buildings in Istanbul create dazzling features through minarets and Domes [13].

However, a study conducted to analyze the human scale and proportion in selected great mosques in Indonesia highlighted that the scale and proportion in Islamic architecture, especially in Indonesia, reflected the need for beauty and efficiency of the space, which matched with the golden ratio [14]. The scale and proportion have a role in creating dazzling feelings as positive feelings related to beauty.

Jatal (2022) discussed the importance of using unity and repetition principles in Islamic buildings in designing the ornamental elements in the exterior wall and portal to attract the recipients and show unity through multi-types of ornaments, which is a type of dazzling features [16]. In other directions, the researchers linked the importance of traditional and local architecture to the design process to create alternative models from the traditional and local architectural elements, such as Domes, Ornaments, Columns, Arches, and Structures [17]. The creation of dazzling features uses local architectural elements in contemporary public buildings.

In summary, the characteristics of dazzling features in Islamic architecture are achieved as follows (figure 2): exaggeration (with dimensions and height), richness in number and types, strangeness (a strange or paradoxical relationship or element), uniqueness (an item or relationship that is being used for the first time), and complexity (adopting more than one element or relationship with intersection). The previous studies highlighted that dazzling features in design can be used in five primary levels: structure, form, architectural elements, interior space, and ornamentation.

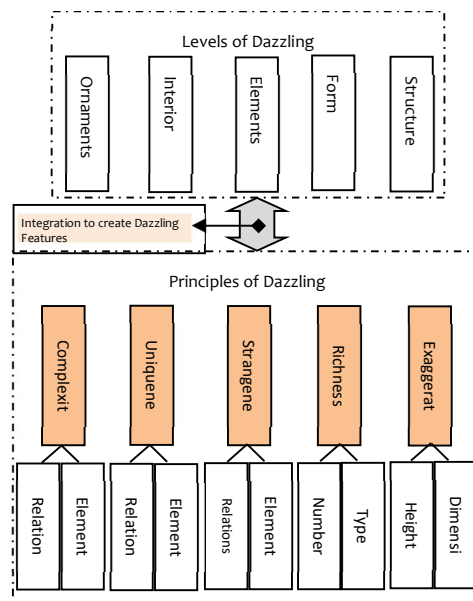


Figure 2. The abstracted dazzling elements

2. METHODS

The study applied a mixed approach (quantitative and qualitative) to reach the aims of the study. The qualitative method applied the visual observation technique to analyze the cases depending on the visual analysis (formal analysis), following an observation list designed according to the abstracted variables from the literature (table 1). This method is widely applied to collect qualitative study data [18]. The checklist contained general information about the selected sample; it is included four sections. The first section is related to observing the dazzling features in the structure. The second is related to the form of the buildings. The third is related to observing the dazzling architectural elements. The last two sections are related to observing the dazzling features in the interior space and ornamentation. The selected samples of the Islamic buildings depended on the architectural value, the historical importance, and the availability of dazzling characters, and the samples are 24 buildings.

The second type of data collection is related to the quantitative approach, a survey designed to collect data from recipients to discover dazzling principles following the structured survey technique, which matches the approach and objectives of the study. [19]. The recipients were selected according to their specialty and area of interest. The questionnaire includes three parts. The first part is made to confirm the respondents' understanding of the meanings, principles, and elements of dazzling features to achieve a procedural definition of dazzling features according to the specialists' responses. The second one relates to the techniques of achieving dazzling features in Islamic religious buildings, which included four questions (structures, form, architectural elements, and interior design). The last part of the questions is made to receive the responses about the dazzling features in the selected cases, which included images and questions for each case separately. The questionnaire was applied through online form, and the specialist are invited to participate.


Table 1. Observation checklist sheet for analyzing the case study

Building code	Building name	location						
Building type	images							
Discretion								
1	Structure							
1.1	Place (P)	Indoor (P1)		Outdoor (P2)		Both (P3)		
1.2	Located in (L)	(L1) Domes, (L2) Pillars, (L3) Portal, (L4) exterior wall, (L5) Iwan, (L6) Arches, (L7) Entrance, (L8) Platforms, (L9) Minarets						
1.3	Dazzling principles (D)	Exaggeration D1	Richness D2	Strangeness D3	Uniqueness D4	Complexity D5		
2	Form							
2.1	Dazzling Causes (FD)	Exaggeration D1	Richness D2	Strangeness D3	Uniqueness D4	Complexity D5		
3	Architecture elements							
3.1	Type	Exaggeration AD1	Richness AD2	Strangeness AD3	Uniqueness AD4	Complexity AD5		
	Dazzling principles AD							
3.1.1	Archs							
3.1.2	Columns& Pillars							
3.1.3	Domes							
3.1.4	Minaret							
3.1.5	Portal							
3.1.6	Walls							
3.1.7	Doors							
3.1.8	Windows							
3.1.9	Iwan							
3.1.10	Iwan& Muqarnas							
3.1.11	Corridor							
3.1.12	Mihrab							
3.1.13	Mimber							
4	Interior space							
4.1	Located in IL	Entrance IL1	Courtyard IL2	main space IL3	Sub-interior space IL4			
4.2	Dazzling principles ID	Exaggeration ID1	Richness ID2	Strangeness ID3	Uniqueness ID4	Complexity ID5		
5	Ornamentation							
5.1	(OL) Location							
	(OL1) Inside Dome	(OL2) Pillars	(OL3) Mihrab	(OL4) member	(OL5) Portal	(OL6) facades	(OL7) windows	(OL8) beams
	(OL9) Court facades	(OL10) minaret	(OL11) Iwan	(OL12) outside Dome	(OL13) arches	(OL14) walls	(OL15) floors	Others
5.2	Dazzling principles OD	Exaggeration OD1	Richness OD2	Strangeness OD3	Uniqueness OD4	Complexity OD5		

3. RESULT AND DISCUSSION

The results of visual analysis of the 24 cases from religious Islamic Architecture (Mosque, Madrasa, Shrine), as shown in (table 2) as an example of analysis, show that dazzling elements at the structural level are used mainly in both internal and external parts with a rate of 77.78% as confirmed by the expert’s survey. The external part of the buildings is 16.67% and the internal part is 5.56%. It indicates the integration of interior and exterior elements to attract the recipients. The dazzling features in structures level existed in the dome and exterior wall with the rate of 22.39% and 19.4% in sequence as shown in Figure 3, which matched with the secondary data as mentioned in the study of Murad [5] and Abdou [4].

Table 2. The observation of the Sultan Ahmed Mosque as a sample of observation analysis

Building code	M01	Sultan Ahmed	location	Istanbul		
Building type	Mosque	images				
Discretion	Ottoman style at Sultan Ahmad Mosque. A square plan on the base upward transformed into a circle, textured tower rod, three roofless balconies with <i>muqarnas</i> elements at the bottom, and a cone shape at the top of the tower. [20]					
1	Structure					
1.1	Place (P)	Indoor (P1)	Outdoor (P2)	Both (P3)	√	
1.2	Located in (L)	(L1) Domes, (L2) Pillars				
1.3	Dazzling principles (D)	Exaggeration D1	Richness D2	Strangeness D3	Uniqueness D4	Complexity D5
		√	√	√	√	
2	Form					
2.1	Dazzling Causes (FD)	Exaggeration D1	Richness D2	Strangeness D3	Uniqueness D4	Complexity D5
		√	√	√	√	
3	Architecture elements					
3.1	Type	Exaggeration	Richness	Strangeness	Uniqueness	Complexity
	Dazzling principles AD	AD1	AD2	AD3	AD4	AD5
3.1.1	Archs	√				
3.1.2	Columns& Pillars	√				
3.1.3	Domes	√	√			
3.1.4	Minaret	√			√	
3.1.5	Portal	√	√			
3.1.6	Walls					
3.1.7	Doors	√	√			
3.1.8	Windows		√			
3.1.9	Iwan					
3.1.10	Iwan&Muqarnas					
3.1.11	Corridor					
3.1.12	Mihrab	√	√		√	
3.1.13	Mimber	√	√		√	
4	Interior space					
4.1	Located in IL	Entrance IL1 Courtyard	IL2 main space	IL3 Sub-interior space	IL4	
		√		√	√	
4.2	Dazzling principles ID	Exaggeration ID1	Richness ID2	Strangeness ID3	Uniqueness ID4	Complexity ID5
		√	√		√	
5	Ornamentation					
5.1			(OL) Location			
	(OL1) Inside Dome	(OL2) Pillars	(OL3) Mihrab	(OL4) member	(OL5) Portal	
5.2	Dazzling principles OD	Exaggeration OD1	Richness OD2	Strangeness OD3	Uniqueness OD4	Complexity OD5
			√		√	√

The structural elements that affect the creation of dazzling features within the building are the dome, columns, gates, external walls, Iwan, entrance arch, platform, and minaret. Moreover, these elements cannot be used together to create dazzling features. However, it can be used in groups of two or three elements as a maximum.

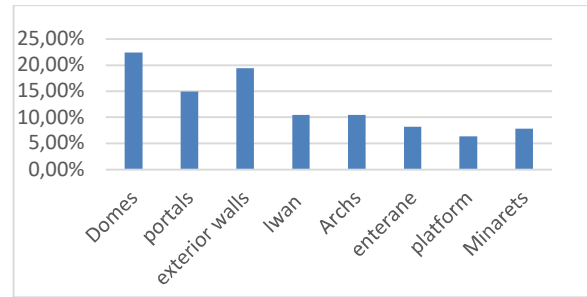


Figure 3. Structural elements that enhance the dazzling concept in Islamic architecture

The results show the most active dazzling principles applied at the structural level, which are, in sequence, richness 27.24%, exaggeration 24.19%, uniqueness 24.19%, strangeness 12.9%, and complexity 11.29%. For that, Islamic architecture focuses on the principles that affect the essential part of the form, the structure. The result partially matched with secondary data highlighting seven principles of dazzling features at the structural level, in which proportion and ambiguity are not active [8][11]. For the form level, the most active principles are richness 30.19%, exaggeration 26.24%, uniqueness 20.75%, strangeness 11.32%, and complexity 11.32% (Table 3) (Figure 4).

Table 3. The relationship between the use of dazzling principles in structure and form levels

Principles	Levels				
	Exaggeration	Richness	Strangeness	Uniqueness	Complexity
Structure	24.19%	27.24%	11.29	24.19%	11.29
Form	26.24%	30.19%	11.32%	20.75%	11.32%

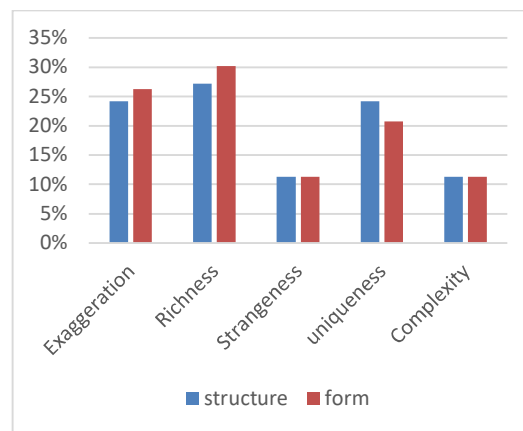


Figure 4. Dazzling principles at structural and formal levels

Islamic architecture gives attention to the richness in both levels (structure and form) more than other principles in these levels to formulate dazzling and attractive buildings, and these principles affect the overall shape. It is what distinguished Islamic architecture from other architectural styles. The structure and form level are the effective factors in creating dazzling features through formal mass, including richness in details. Exaggeration is rated as the second principle in creating dazzling features in the structure and formal level, reflecting the relationship between monumentality and dazzling concept. The uniqueness is rated as the third position in applying dazzling concept in Islamic architecture, which is matched with previous studies as the Islamic

architecture unique feature for each region in the Islamic world and followed by unique form and structure. The less effective principles in creating the dazzling structure and form levels are complexity and ambiguity due to the faith in simplicity, which characterized Islam as a religion and Islamic architecture.

At the level of architectural elements, dazzling principles were influenced in different proportions. The results showed (Figure 5) that arches were more affected by the principle of richness by 50%. While the columns and pillars were more affected by the principle of volumetric exaggeration by 40%. The dome was affected the most by the principle of richness by 25.64%, and the minaret was more affected by the principle of richness by 25%.

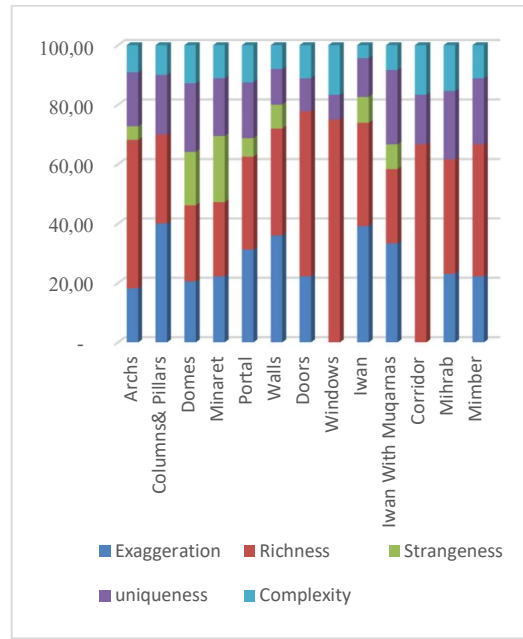


Figure 5. The correlations of dazzling principles with architectural elements

In comparison, the gate was more affected by the principles of volumetric exaggeration and richness equally by 31.25%. The principles of exaggeration and richness affected the walls more by 36%. The door element was affected by the principle of richness by the most significant percentage of 55.56%. Windows were also affected by the principle of richness by 75%, the Iwan element was more affected by the principle of exaggeration by 39.13%, the Iwan element with Muqarnas was affected by a more significant percentage by the principle of exaggeration by 33.33%, and the arches were affected by a more significant percentage by the principle of wealth by 66.67%.

For the mihrab, it has dazzling features and is influenced by the principle of richness, with the most significant rate of 38.46%. Meanwhile, the member has dazzling features and is influenced by the principle of richness, with the most significant rate of 44.44%. The results show that architectural elements have a significant role in achieving dazzling features at different rates affected by the dazzling principles. For most elements, such as arches, domes, minarets, entrances, high walls, doors, windows, and corridors, Mimber and Mihrab applied the principle of richness to create dazzling features. In the second position, the principle of volumetric exaggeration is used in elements such as Columns, Pillars, Gates, Walls, Iwan, And Muqarnas in Iwan. The application of these principles indicates the style of Muslim architecture in dealing with the elements to create dazzling buildings.

The results highlighted the dazzling interior space level of Islamic buildings with the highest percentage for the main interior spaces with a rate of 35.42%, followed by the entrance space with a rate of 25%, followed by the inner courtyard with a rate of 22.29. Finally, within the secondary interior spaces, the rate was 16.67%. The application of the dazzling concept in interior spaces was influenced by the principle of richness at 26.98%, followed by the principle of uniqueness at 25.4%, the principle of exaggeration at 20.63%, the principle of complexity at 14.29%, and finally, the principle of strangeness by 12.7%.

The dazzling level of ornamentation is used within the decoration and ornamentation in various locations in the buildings, which is arranged according to the intensity of use (from highest to lowest). The rate of using dazzling ornamentation inside domes and gates is 10.91%. While for arches, it is 10%. Further, the walls are at a rate of 9.09%, followed by the inner courtyard facades at 27.2% each. The rate of using dazzling ornamentation at the facades, windows, Iwan, and outside the domes is 6.36% for each. The facades of the inner courtyard is at a rate

of 5.45%, followed by columns and pillars at a rate of 4.55%, dazzling decoration of the Mamber and floors at a rate of 3.64%, and finally, dazzling decorating pillars at a rate of 1.82%.

The most influential methods in achieving the dazzling ornamentation level are richness at 27.84%, followed by the principles of uniqueness with a rate of 24.95%, complexity with a rate of 21.32%, and strangeness at 14.75%. Finally, the principles of exaggeration are a rate of 11.48%.

The results from the structured survey show the matching with the visual analysis of the cases with light differences. However, the results from the survey show that dazzling features can be created in the architectural elements, considering the exaggeration and richness principles at a high rate, then uniqueness comes at last. Meanwhile, strangeness and complexity have light effects, as shown in Figure (6).

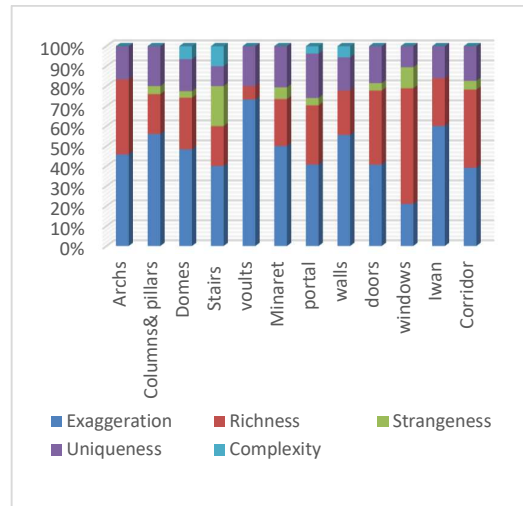


Figure 6. The survey results showed the percentage of applying the principles in the architectural elements.

The survey shows that the dazzling location existed in the general form (23.68%) and structure, interior space, and architecture form with the same rate (21.05%). At the same time, the ornamentation has a lower rate (13.16%). However, the dazzling features can be overall applied to Islamic buildings. In the details of the constructional elements, the results show that columns and ceiling were applied with a rate of 88.89%, which is matched with analysis results, including domes and beams. Moreover, the dazzling features created at the structural level depends on exaggeration (23.23%) and uniqueness (19.64%), strangeness (17.86%), richness (19.64%), and lastly on complexity (14.29%). According to the results, the architectural form in Islamic architecture considered the visual appearance of the buildings, which is a type of attraction.

The dazzling features are linked to the perceptual concepts such as unusual, suddenness, and attraction as the most connected concepts with the rate of 23.33%, 20%, and 16.67% in sequence. These results interpreted the importance of applying dazzling features in Islamic architecture, which matched with the architecture design principles in Islamic architecture. Therefore, the dazzling feature is created with a relationship to the physical, visual, and technological aspects more than the psychological aspect because the dazzling feature is a reaction or the sense of perceiving the tangible objects in the design.

4. CONCLUSION

The practical study focused on using specific principles to create dazzling features within specific levels by focusing on specific elements. The structure level considered the richness more than the rest of the principles, followed by the exaggeration and uniqueness in creating dazzling features within the external and internal structure of Islamic religious buildings by focusing on several elements such as domes, external walls, high walls, Iwans, and arches respectively.

At the level of the general form of the Islamic buildings, richness is applied more than the rest of the principles to create dazzling features. The use of the richness reflected the interest in formal details and distinguished it from the rest of the buildings. The general form of the building gives off the dazzling characteristic through the formal masses with rich details and does not rely on the details themselves. The principles of volumetric exaggeration within the general form of the building are in the second level of interest for Muslim architects, which reflected a strong relationship between the general form of the building and the monumental scale, which is one of the principles adopted to achieve dazzling features within Islamic architecture.

The principle of complexity was not widely adopted in creating dazzling features within the levels of the structure and the general form of Islamic religious buildings. It indicates the importance of adopting simplicity in dealing with the general form and structure of the building to apply the dazzling concept in Islamic architecture.

At the level of the architectural elements, the majority of these elements successfully applied dazzling features by using the principle of richness and a lesser influence of other principles. Meanwhile, the other elements have applied dazzling concept by using the principle of volume exaggeration and a lesser influence of other principles, which reflects the more significant influence of these two principles.

The concentration of dazzling concept within the level of the interior spaces according to the importance of the space was in the following sequence:

- The main interior spaces
- The entrance spaces
- Interior courtyard space
- Finally, the secondary interior spaces

The most used principle in applying dazzling concept within these interior spaces was the principle of richness, the next one is uniqueness, followed by the principles of exaggeration and complexity, and finally strangeness with minimal use.

At the decoration level, the locations arranged according to the highest ornamental fascination are as follows: The highest decorative dazzle for each domes, gates, arches, wall, mihrab, and minaret. It is followed by, in a less dazzling concept implementation, the decoration of each facade and window, Iwans, the outside the domes, facades of the inner courtyard, columns and pillars, Mimber, and floors. The most used principles in achieving dazzling features within these sites was the principle of richness, uniqueness, and then complexity, followed by the principles of strangeness and exaggeration in lesser proportions.

ACKNOWLEDGEMENT

The researchers acknowledge the support of the University of Mosul, College of Engineering, Department of Architectural Engineering, while collecting data and analysis and registering the research under the scientific plan of the department for the academic year (2021 -2022) with registration No. (45\2117), The thirty-third session of the College Council dated 11/8/2022.

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