International Journal of Engineering and Science Applications
ISSN: 2406-9833
IJEScA

Fountain of Hasanuddin University Campus in Gowa as a Focal Point and a Thermal Control

M. S. Latif[1], J. Zulkarnain[2], S. Syam[3], R. A. Ishak[4]

[1]Lecture of Architecture Department, Hasanuddin University email: syavirlatif@yahoo.com
[2]Master of Interior Architecture candidate, Herberger Institute for Design and the Arts, Arizona State University email: jzulkarn@asu.edu
[3]Lecturer of Architecture Department, Hasanuddin University email: sary-archi@yahoo.com
[4]Lecturer of Architecture Department, Hasanuddin University email: rahmi1403@gmail.com

ABSTRACT

In architectural designs, ponds and the like generally have a primary function other than as an aesthetic element, it also becomes the thermal controller of the surrounding environment. Hasanuddin University Campus in Gowa has a fountain pool located at the front entrance of Library Building and Center of Technology (CoT) Building. In fact, the existence of this fountain pond is relatively not become the attraction for people who pass around the pool area. Physically the function as a thermal controller is also not felt by those around them. This study finds out why the design of fountain ponds did not work as a focal point of the visual design composition? Why does not the fountain pool serve as a thermal controller from the surrounding environment? What should be done so that the expected fountain pool function as a focal point and as a thermal controller can be achieved? The results show that the existence of a fountain does not succeed to be a campus focal point because the visual design composition ignores the site requirements and visual elements that influence people to direct the view toward the fountain.

Keywords: Pond, architecture, design, visual composition, Unhas

I. INTRODUCTION

In the modern architectural design of the fountain as well as decoration, it is also an oasis of a mass system that serves as the air conditioning of the surrounding environment. Its beauty and coolness make people like to gather to spend free time in a fountain. Therefore the function of the fountain as a focal point and thermal controller make fountain is often considered its presence in an architectural design composition.

Hasanuddin University (Unhas) Campus in Gowa has a fountain located on the main campus area opposite the Library Building and the Center of Technology (CoT) Building with the faculty car park facilities. Its location shows that this fountain serves as a public space that is accessible to everyone. With an area of about 566.0 m2, it appears that the fountain dominates the front area of the main building of the campus.

As a public space, campus fountain is relatively quiet, because no one is seen gathered at that location. This is contrary to the purpose and the purpose of building a fountain. This condition is seen from morning until evening when campus activity takes place. The post-habitable fountain design conditions show that humans moving into the campus spaces have not been visually directed to move towards the fountain. Humans are not directed to move toward the location of the fountain, this gives the impression that the fountain is visually separated from the mass system.

The forms of architecture work not only have aspects of function and strength but also appear to be enjoyed visually. The work of communicating architecture conveys messages to viewers through visual relationships. Therefore, to make the design, every architect needs to be equipped with the ability to interpret visual language [1]. The principle of design aims to use design elements in shared and separate architectural works to create a visual design.

A designer can work without awareness of knowledge about one of the principles, rules, or concepts of visual design, but rather because of the interests of his taste and his personal sensitivity to the visual relationship. But through understanding, they will surely enhance their abilities in visual organizations [2]. This visual language that guides human beings to understand the meaning and function of architectural design as the hope of the architect.

The fountain is also known for Ancient Egyptian architecture, Ancient Greek, and Roman. Although fountains generally have beautiful designs, the main function of the fountain is a spring for drinking, bathing, and washing needs for the town and village [3]. In the past, the fountain worked with the gravity system in order to be able to squirt into the air. In order to optimally squeeze, the fountain requires a water source located at a certain height [4]. Today's fountain technology uses high jets technology to produce luster and light effects [5].

Fountain as an architectural element has been discovered since ancient civilization (2000BC) in the ruins of the ancient city of Sumeria (Lagash, Iraq). As the Middle Ages, the fountain water channels were damaged, so there were many fountains damaged and stopped working. Fountain then only found in literature or art, in remote monasteries, or in the palace gardens. Fountain no longer serves the needs of the common people.

In the Middle Ages, fountains were associated with the Garden of Eden, the source of life, purity, wisdom, and innocence [6][7][8]. In the twentieth century, fountains functioned more as an aesthetic and thermal control element of a building or city. For health reasons, the fountain is no longer used as a drinking water source for city residents. The fountain is designed as a public space and entertainment place for people who adorn the plazas, crossroads, or buildings.

Generally, countries with hot climates using fountains that rely on the coolness of water in addition to being used as a source of drinking water, it also becomes a thermal controller for the environment. The vaporized moisture grains from the fountain pool make the air around the thermal cooler, so people become comfortable around. The fountain is also placed in front of the building so the cool air can push the hot air moving out of the building.

District of Gowa as Hasanuddin University's campus location has relatively high air temperature up to 33o C. Ideally with such air temperatures, the existence of the fountain becomes a cooling cavity for the environment. Unfortunately, relatively the campus fountain is unlikely to invite people to feel the coolness it produces. Even when the air temperature is very hot, people do not move to the area around the fountain which besides having cool water is also protected from the sun.

2. THE STUDY METHOD

1. Time and Location

The study was conducted at Faculty of Engineering of Hasanuddin University Campus in Gowa from August to September 2016. The study type is qualitative research. The study involved 50 respondents consisting of students, lecturers, and staffs with their respective numbers as shown in Table 1.

Table 1. Research Informant

No.	Research Informant	Total
1.	Student	25
2.	Lecture	15
3.	Staff	10
	Total	50

1. Data Collection

Data were collected by (a) participant observation to get an idea of what people doing at the fountain location; (b) focused interviews and in-depth interviews with participants to gain in-depth information about their perceptions of fountain presence; (c) focus group discussions (FGDs) are carried out to the architecture student group to get an idea of the design components affecting the visual composition of the fountain; and (4) desk review of secondary data.

2. Data Analysis

The analysis is done alternately with the data collection process by (a) conducting a domain analysis to obtain the data atmosphere of the fountain; (b) conducting a taxonomic analysis based on domains that have been found to obtain a complete taxonomy and detail of the phenomena occurring at the fountain location; (c) performing a component analysis to find contrasts between fountain design elements; and (d) conducting theme analysis to look for problem relationships in the fountain design composition system as part of Unhas Gowa campus design as a whole.

3. RESULT AND DISCUSSION

1. Focal Point

a. Location, position, and fountain shape

The location and position of the fountain is right in front of the street opposite the Library Building and CoT Building (See Fig 1). Location of the fountain area physically separated by (a) fountain distance with the adjacent remote building; and (b) varying floor altitudes that make it difficult for people to move freely from and toward the fountain.

Between the open hall of the Library Building and CoT Building with the fountain separated by a street 14 m wide with a height of 20 cm below the lowest floor of the hall. This road has a boulevard that serves as a path separating the flow of vehicles coming and going with a height of 20 cm that makes people from the open hall cannot move directly to the direction of the fountain. Between the curb, with the fountain location, there is also an open fountain hall with a length of 20 m. The distance and the height difference of this floor physically separates the spaces that are in front of the entrance of the Library Building and CoT Building. Likewise, the fountain with the surrounding buildings visually make the fountain not united as a unity of composition (See Fig 2).

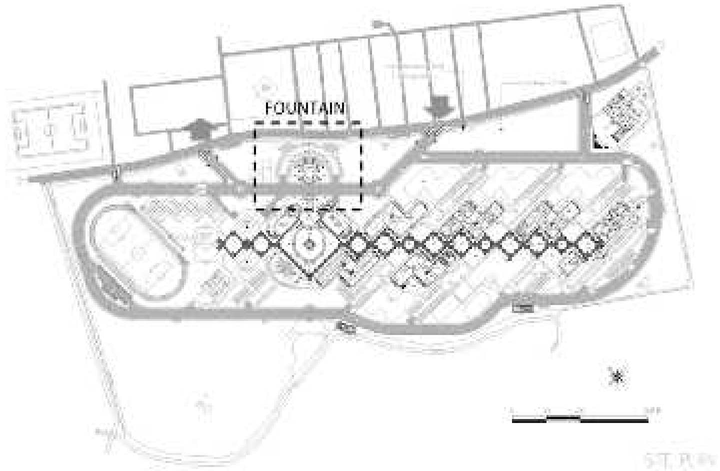

Fig. 1. Site plan of Unhas Gowa Campus

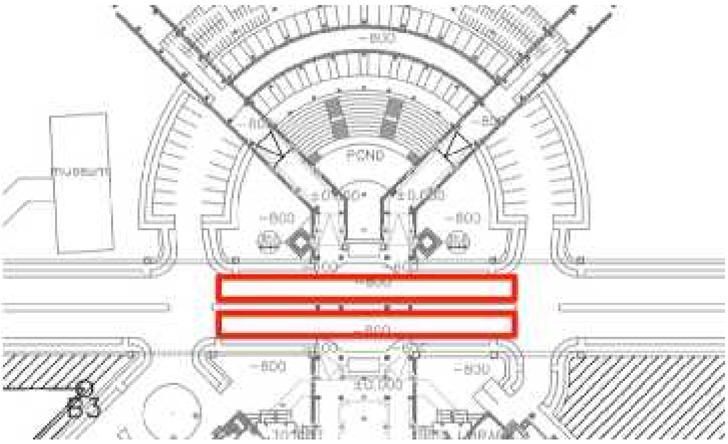

Fig. 2. The distance and the height difference of this floor physically separates the spaces that are in front of the entrance of the Library Building and CoT Building

The focal point is the first part that is captured by the eye when we see an object. Hersman states that the focal point is the place where our attention is naturally directed and where the view stops easily. Without a focal point, our attention will spread, as the eye sees it all without finding a place to relax [15].

Focal points can be placed in the most viewed areas, but can also be due to a particular design element that acts as an accent or emphasis that draws people's attention to the area which, without such emphasis, does not have the privilege. The council is something that is different and contrasts with the surrounding environment so that it affects the visual weight so that it dominates the viewers' attention [16] [17].

Since the design details that are seriously aimed at attracting the eye viewers, they should be placed in areas most viewed by observers. If the accent is the only accent in the overall design, the accent becomes the center of attention (point of interest) or focal point [18].

b. Viewpoint

The location of the fountain can be reached on foot from the lecturer's parking area located behind the fountain and the main entrance that located in front of the Library Building and CoT Building. On the left and right side of the fountain are the hallways connecting the lecturers' parking lot with the open hall of the Library Building and CoT Building. The hall roof is a flyover connected to the 1st floor of the buildings of the Library Building, CoT Building, Classroom Building, and department buildings. Visually, the fountain can only be seen from the direction of the Library Building and CoT Building only. The fountain is not visible from the road outside the campus because it is on the wall of the faculty parking facility located behind the fountain.

People walking from the direction of the Library Building and CoT Building to the lecturers' parking lot are directed straight to the passageways beside the fountain. In the hallway, people's views are hindered by the presence of relatively large columns and flower pots obstructing the vastness of the view so that those in the corridor find it difficult to direct the view directly toward the fountain.

The human horizon point of view horizontally is 30° left and right, while vertically 15° up and down from the eye [21]. This point of view determines how people perceive the object they see. In this case, we will observe how people see the fountain when they are at certain points around the location (See Fig 3).

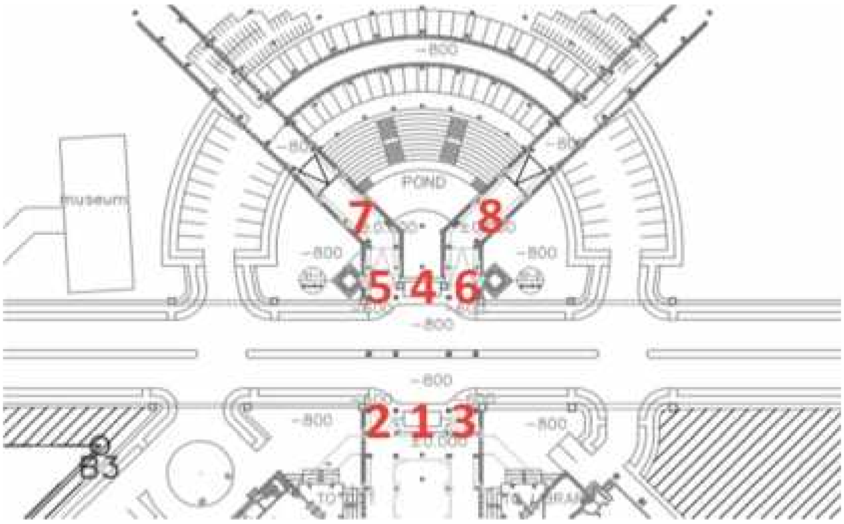

Fig. 3. Observer's point of view around the fountain

Visually from point 1 in the open hall of Library Building and CoT Building, the view to the fountain location is closed with the presence of three palm trees right at the center of the front hall. In addition to the presence of palm trees, there are several columns that block observers' views, either in the center of the front of the fountain in the open fountain hall or walking in the breezes beside the fountain. The palm tree and the columns become the wall separating the fountain by point 1, the place where the observer is located.

Fig. 4. The view from point 1

Fig. 5. The view from point 2

Fig. 6. The view from point 3


Fig. 7. The view from point 4


Fig. 8. The view from point 5


Fig. 9. The view from point 6


Fig. 10. The view from point 7


Fig. 11. The view from point 8

In points 2 and 3, views to the fountain are also blocked by columns. When people move from point 1 to point 4, from point 2 to point 5, from point 3 to point 6, the view to the fountain is still closed by the presence of columns. When people move from point 6 to point 8, from point 5 to point 7 or vice versa, then the view toward the fountain is also covered by the presence of the overpass columns (See Fig 4 to 11).

The fountain's closedness from multiple points of view makes the fountain completely separate visually with spaces where people are passing by. As a result, the presence of the fountain is not recognized by observers. Without people's awareness of his presence, the fountain may not function as the focal point of the design composition.

c. Contrast

The fountain is designed in the form of a semi-circle pool that has three fountains. Behind the fountain, there is a tub of storied plants starting from the edge of the fountain to the heights reaching the roof of the parking lot, which is located the logo of the Faculty of Engineering Unhas. Water in the fountain serves only as an aesthetic element because the fountain does not have a water purification system.

On paper, the shape of the curve of the fountain does look very different from the general form of rectangular buildings. Nevertheless, visually, the appearance of the fountain does not show any significant difference because the elements of the building around the fountain follow the appearance of the elements of the surrounding buildings, such as the shape of the flower tubs, the columns, the ceiling, the floor pattern, the material type, and color. Thus the different forms of the fountain with other buildings is not significant as a pressure to the eyes viewers directed to the fountain.

The elements of existing buildings on the floor, columns, and ceiling in the fountain area appear in monotonous rhythms. The surface of the lobby floor does not have a floor pattern that serves as a beat that reminds people that there is something different in that location. Similarly, the pattern on the columns and ceiling of the building. No contrasting forms of visual signs are available that can communicate a message to viewers that there is an important object of interest to look at. Thus people passing by do not realize that there is a fountain in the location they are going through.

In the forum discussion group with students when discussing the planning drawings, the discussion yields the conclusion that structurally the presence of overhead bridge columns obstructs the view towards the fountain by avoiding partial columns and raising some of the other columns. The omitted columns are right in the middle of the front of the fountain. When the columns are removed, the view towards the fountain becomes more open, and the fountain location does not become a closed area.

2. Thermal Control

The location, position, and shape of the fountain building keeps the hot air coming from off-campus roads and the campus's main road does not allow it to pass through the water vapor area of the fountain so as to reduce the temperature of the hot air. First, the hot air from off-campus streets into the campus moves over the overpass and does not cross the fountain. Secondly, the volume of water vapor produced by the fountain is relatively insignificant as the surrounding air conditioner. From the figure, it is known that although the fountain design area is quite significant compared to the surrounding buildings ie 566.0 m^2, the area that serves as the pool is very small i.e. 102.0 m^2. Most design areas function as ornamental plants and artistic ladders. This small fountain surface area is difficult to produce water vapor grains capable of making cool air around the fountain. Thus, no cool air chamber with sufficient pressure to push the hot air up. Third, some of the hot air from the main streets inside the campus moving toward the fountain does not have a cool effect on the buildings in front of the fountain, because the air will move toward the openings above the fountain (See Fig 12).

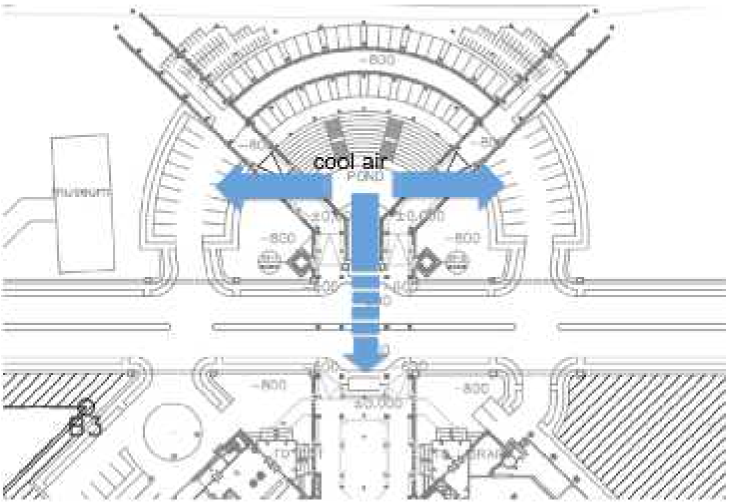

Fig. 12. The cool air that moves from the fountain has no significant effect on cooling the surrounding area of the building due to the small fountain surface area and considerable distance

In the absence of temperature and humidity control systems, environmental air cooling processes occur naturally through air movement [19]. When the temperature is hot, the air will rise to the top so the air pressure becomes lower. Vice versa when the temperature is cool, the air will drop so that the air pressure rises. This air pressure difference makes wind. Cool air will push the hot air up.

An important set of air movement phenomena is explained by the Bernoulli theorem of fluid behavior (which considers air to be a fluid). Defined by the 18th-century Swiss mathematician, the Bernoulli theorem includes the observation that fluid pressure decreases as the rate of fluid movement increases [20]. Bernoulli principle is used by the architects to cool the air without the help of mechanical systems.

Based on this principle of air movement, the architectural design arranges for the placement of hot and cool air sources in order to produce winds that provide coolness for the environment. The use of fountain with adequate surface area whose water serves as an air conditioning environment also serves to push hot air out of the environment. If the curtain area of pool water is sufficient, the hot air through it can also be cooled. Thus the humidity of the surrounding air will increase and the air becomes cooler.

4. Conclusion

The results show that the existence of a fountain does not succeed in becoming a campus focal point because the visual design composition ignores the visual factors that influence people to direct the view toward the fountain. The neglect is due to: (1) the location and position of the fountain separate from the overall design and closed from the views of the people in the surrounding environment by palm trees and layers of roadside layers, and the existence of a road boulevard; (2) the contrast of the fountain form is incapable of appearing to dominate the viewers view as a whole as the building elements around the fountain are the same as the other building elements; and (3) there are no visual signs on building elements from floors, columns, and ceilings that can communicate the message that there are fountain objects that are important to look at.

The role of the thermal controller is not successful because: (1) the location and position of the fountain relatively far enough surrounding buildings; (2) fountain surface area not large enough to produce air humidity for the surrounding environment; and (3) the hot air that is expected to be cooled by the fountain has no path to get to the campus buildings.

The role of the fountain as a focal point can be enhanced by improving the location and position of the overpass bridge columns to generate an open view of the fountain. It is necessary to design visual signs on floors, columns, or ceilings that can communicate to people the presence of fountain as an important object to look at. The role of the fountain as a thermal controller cannot be increased because the cause is the location factor and the magnitude of the fountain. Thus, the role of the fountain is sufficiently directed only for aesthetic functionality and not as a thermal controller.

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