

Man-Environment Relationship of Public Square Case study in Dutch Square Melaka

Tan Kean Jie, Nor Haslina Ja'afar

Abstract: *The square is one of the major constituent element of open public space in urban design. It is seen as the core of a city which functions as a focal point in the public space network, providing a space for the community social interaction. However, many of the new public spaces in the 20th century has been a void setting and unsuccessful to create a public open space for social interaction that is vibrant with life. The notion of square was adopted from the European culture as far back as 17th century and has been adapted in Malaysia. This could be seen in today's square design in Malaysia. However, the behaviour pattern indicate otherwise as the present day square design does not respond to the local climatic context with lack of shaded areas. Hence, people tend to avoid social interactions in public square during daytime due to undesirable weather condition. Therefore, the aim of this study is to determine the positive aspects of traditional square that has been successful in supporting the community social interaction, and establishing a general guide for the design of new square as a public open space in Malaysian context. Amongst the consideration to be derived from this adaption is the Malaysian local context in terms of historical significance, culture and climate. Dutch Square in Melaka Historical Town was chosen as the case study, because it represents a model of traditional square as a public open space that still functions in term of attracting people to this day. A combination of quantitative and qualitative approaches were used in this study. Behavioral mapping allowed for statistical analysis where as observation and still photography as the descriptive to support the outcome of behavioural mapping. Therefore, the data collected are more reliable and able to be cross checked for further examinations of the findings. Findings showed that the relationship of the urban context and social behaviour are associative with one another. The square plays an important role to provide a setting in the built environment and the behaviour pattern and activities to determine the success of the square as an open public space. The aim is to provide an appropriate public open space in the built environment that is robust and meaningful to the community.*

Keywords: *Public Square, Landscape, Man-environment, Behaviour*

I. INTRODUCTION

The square within the built environment context, is a public open space that supports the activity within the local context in terms of commercial and social functions. The square within the built environment context, is a public open space that supports the activity within the local context in terms of commercial and social functions. Hence, it provides a setting for human activities to take place within the city (Moughtin 2003) as well as reflecting the locality and

background of the local community (Memluk 2003). A successful square is able to enhance the spatial quality of the surrounding building, hence promoting a welcoming atmosphere to the public. This atmosphere can be seen through the attraction of public to frequent and utilize the space as such of St. Mark Square in Venice and St. Peter Square in Rome. However, the factor of human interaction with environment is often neglected by designs that are not responsive to the human scale and behaviour (A.Bashri 1988). A public square is designed as setting for human interactions, therefore, the understanding of the man-environment relationship have to be considered.



Fig. 1 Dutch Square Melaka, Malaysia

Through the case of study of the Dutch Square located in the historical city of Melaka, this research intends to identify the factors within relationship between the built environment and human behaviour. Dutch Square has been a chosen as case study due to the multitude of historical events of over 500 years that shaped its identity today and the significance as a heritage site (UNESCO 2008). The history of Dutch Square plays an important role to the community in terms of function with variety of activities that has taken place throughout the years creating a sense of place and sense of robustness (Zakariya 2015).

It is highlighted that the importance of learning from historical site as the settlement of city is a result due to the displacement of time that has taken place (Norhaslina 2014). To further develop an understanding of the concept of man-environment, that comprises of two components that correlated which is the environment and the behaviour of man. Overall, man-environment concept refers to the relationship between human and the surrounding environment.

Rapoport (1977) suggested that the definition of man-environment relationship relates to i) the characteristics of an individual or a group of individuals shape the

Revised Manuscript Received on April 07, 2019.

Tan Kean Jie, Program of Architecture, Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia

Nor Haslina Ja'afar, Program of Architecture, Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia

Man-Environment Relationship of Public Square Case study in Dutch Square Melaka

environment, ii) how and how much does the physical environment affects an individual?, and iii) what is the mechanism that connects the relationship between man and environment? Based on the definition, a physical environment has the potential to support or obstruct a particular activity or behaviour.

Firstly, on the concept of environment, the definition of environment in the context man-environment studies refer to the built environment as a setting for human activities (Rapoport 1977). In this study, the environment refers to the public square that serves as a public open space with the function of providing a space in the urban environment for social and commercial activities. The physical characteristic of a square plays an important role that defines the type of function and activities held in place. Zucker (1959) states that the physical characteristics can be categorized into 3 different categories namely the sense of enclosure, dimensional properties and landscape. Among the aspects, landscape stands out to the public as its one of the key features of the square that can be seen through the eyes as a scenic view (Whyte 1980).

Also, landscapes are often integrated with the other physical aspects of the square to form an integrated functional space such as integrated seatings that maximise the sittable space (Whyte 1980). Also, landscape creates a comfortable environment through the response to the local climatic condition. Hence, allowing for more public activities within the space. Secondly, on the concept behaviour in the context man-environment studies refers to the human activity that occurs in the built environment such as thinking, walking, resting, talking and so on (Zeisel 1984).

Based on the literature reviews, it can be inferred that an individual behaviour in the built environment is a response towards the environment that can be in a positive or negative way. An environment is the built form that also comprises of social and psychological aspects. In this study, the limitation only includes the landscape features of the physical aspect of the environment and behaviour that can be found within the context.

Thus, the aim of this study is to identify the factors in both landscape and behaviour aspects that determines the relationship between the two aspects. However, it is necessary to mention that the physical and behaviour aspects are not independent of one another as there various factors that could impact on the man-environment relationship in the public square.

II. PROBLEM STATEMENT

Malaysia is a country that is located near the equator with the climatic condition categorized as hot and humid throughout the year. The average rainfall is 250 centimeters (98 years) per year and the average temperature of 27°C. The climate of the areas is affected by the presence of mountains throughout Malaysia, and the climate can be divided into highlands, lowlands, and coastal areas. In the coastal areas, the climate is sunny with temperatures between 23 and 32°C, and rainfall ranging from 10 to 30 centimeters per month. Lowland has the same temperature, but follows a more distinct rain pattern and shows a very

high level of humidity. Whereas, highland areas are cooler and humid, and show greater temperature differences. A large amount of cloud cover is on a plateau, with humidity (relative humidity) that does not fall below 75% (Cavendish 2007).

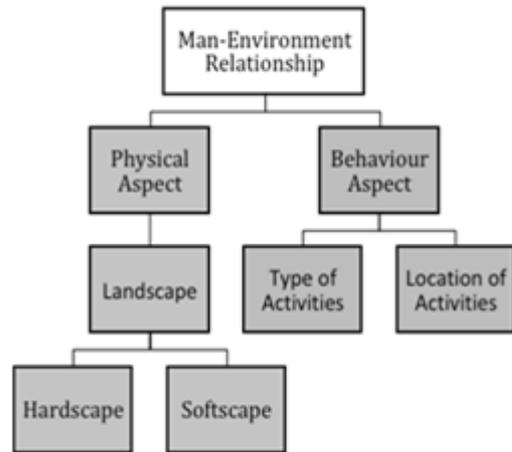


Fig. 2 Relationship between Landscape Components and Behaviour

Hence, the local climate is one of the major factors that contribute to the human pattern in the public sphere as well as the design of a square. An observation by William H. Whyte in Farragut Square, New York (1980) shows that people enjoy direct sunlight until noon. New York is located in the northern part of North America with humid humid climate where winter temperatures range from 4° C to 12°C, while summer is 27 ° C. This contrasts with the local climate and culture in Malaysia. The first issue is that the square design in Malaysia is not responsive to the local climate. Indirectly, this situation changes the pattern of behavior and the presence of locals to the square as an public open space for social activities.

III. METHODOLOGY

The study was conducted in mix mode which comprises of qualitative and quantitative methods. The data of qualitative method is collected from the photography and observation. Behaviour mapping and behaviour categorization are done based on the data from observation and photography supports the data descriptively. Quantitative datas are derived from the behaviour mapping that allows for statistical analysis. Based on both qualitative and quantitative approach, the datas are able to be cross checked with one another to ensure the validity of the findings.

Observation and photography are the most appropriate for this study as it is unobtrusive and allows for a natural behaviour to take place in the area of study (Zeisel 1981). Observation and photography are done through structured observation where a set of criterias have been precoded in a checklist (Zeisel 1981) to collect the relevant datas for the study. To determine the precoded checklist, a pilot observation is done on the square to determine the common activities.

As such, behaviour categorization has defined the common activities that are commonly found within a square (A.Bashri 1988) namely commercial, leisure and traffic activities. With the precoded checklist, the activities that take place are recorded through behaviour mapping that marks the location of the selected activity on the square plan.

The triangulation is used as a strategy to ensure the validity of the findings through different sources (Carter et al 2014). Through this method, the involvement of different data collection techniques and data analysis has gained a broad and comprehensive perspective (Norhaslina 2014). Therefore, the data collection for this study is composed of primary and secondary sources. Primary data is obtained through observation of site context, physical elements as well as behavior, behavior categorization and behavior mapping. Meanwhile, secondary data is obtained from previous research on human behavior and environment. The use of triangulation methods was also supported by previous researchers such as Norhaslina (2014), Zeisel (1981) and also A.Bashri (1988). Thus, the use of diversity of techniques and data sources will result in a valid research findings.

Table. 1 Usage of Methodology for Data Collection and Analysis

Research Question	Research Objektive	Data Collection	Methodology
1. What are the physical aspects of environment support human behaviour	To identify the physical aspects of environment that support human behaviour	1. Size and width of square 2. Landscape and Physical characteristic of square	1. Observation and Photography
2. How does the physical built form correlates with behaviour?	To study the correlation between the physical built form and behaviour	1. Human behaviour and activities. 2. Frequency and location of human activities.	1. Behaviour categorization 2. Behaviour mapping

IV. RESULTS AND DISCUSSION

The findings on the landscape properties include both softscape and hardscape. The softscape such as plantings, trees and water elements are significant in encouraging activities within the square. This is due to the softscape response to the local climatic conditions which is hot and humid. The plantings and trees provide a comfortable thermal environment and shades the people from the harsh mid afternoon sun.

Whereas, the water element of the square, the Queen Victoria's Fountain creates movement of water that invokes the senses of the public for interaction by drowning the noise from the traffic.

This allows the spatial environment to be conducive for human interactions with one another. Apart from that, the water fountain has been a historical memento from the past

and its presence today marks the square as a local landmark. This encourages more attraction within the local and foreign community to visit the Dutch Square as a tourist attraction.

On the other hand, the findings of the study on the hardscape incorporated integral sitting approach to the seats and planter box in Dutch Square. Seats are integrated with existing physical elements such as planter box, steps and water fountain to maximize space as sittable space. The difference in floor pavement materials in the square are also used to distinguish the square space function. Finding shows bricks used for pedestrians with high traffic activity while tile and gravel were used for open space. Different pavement materials used, improve the spatial quality and the place's character.



Fig. 3 Landscape Components Relationship with Behaviour

In short, landscape is one of the important components in environment design in terms of the convenience of square visitors from the local weather context and contributing to the city's harmonious sights. Landscape also has the potential to be a local landmark and an important node in a city context. Figure 3 has identified the landscape components that can be found in Dutch Square that consist of softscape and hardscape. Through this identification, the mapping will allow a further understanding of the relationship between the components and human activities. Figure 4 shows the relationship between the environment with human activities through the use of behaviour mapping. This indicates the location with the highest concentration of activities that can be found within the square. It can be seen that tree elements contribute a high number of activities within its canopy range.



Fig. 4 Relationship between Environment and Behaviour through Behaviour Mapping

V. CONCLUSION

The findings of this study find that the activity in the square is closely related to the perimeter of the square can be seen in Dutch Square where the trees are planted. This situation can be seen through the behavior mapping that shows the activity focus of 40% in the perimeter of the square. This is situation is also due to the location of Dutch Square which is surrounded by public buildings and local nodes that contribute to public access and behavior in the square. Mature trees contribute to the activity of 25% and provide shade at midday with water elements providing a comfortable atmosphere for the public.

In summary, the findings of this study look at the Dutch Square physical aspects of landscape support to support the diverse activity with the context of local location and weather context. The behaviour mapping shows the pattern of how human behave and response in the physical environment.

ACKNOWLEDGMENT

The authors would like to express their heartiest thanks to the Ministry of Education Malaysia and Universiti Kebangsaan Malaysia for supporting this work. Credit also goes to various organizations that have assisted towards the success of this work.

REFERENCES

- Ahmad Bashri Sulaiman. (1988). A Man-Environment Approach Towards The Design of Public Squares in Islamic Cities. Institute of Planning Studies University of Nottingham.
- Alexander, Christopher., Ishikawa, Sara., Silverstein, Murray., Jacobson, Max., Fiksdahl-King, Ingrid., Angel, Shlomo. (1977) A Pattern Language, Towns, Buildings & Construction. Oxford University Press, New York.
- Bertrand, Levy. (2012). Urban Square as the Place of History, Memory, Identity. Universite de Geneve. 156 – 173.
- Cavendish, Marshall. (2007). World and its People: Eastern and Southern Asia. Marshall Cavendish
- Gehl, J., Kaefer, L. J., & Reigstad, S. (2006). Close Encounters with Buildings. Urban Design International, 29–47.
- Golembiewski, Jan. (2014). Building a Better World: Can Architecture Shape Behaviour? University of Technology Sydney.
- Harun, Nor Zalina. (2008). The Changing Roles of Public Spaces in Malaysia. Department of Landscape Architecture, Faculty of Built Environment Universiti Teknologi Malaysia.
- Harun, Nor Zalina., Ismail Said (2015). Meaning of a Public place: A

- Story of Padang Pahlawan. Department of Landscape Architecture, Faculty of Built Environment Universiti Teknologi Malaysia.
- Honjo, Tsuyoshi. (2009). Thermal Comfort in Outdoor Environment. Faculty of Horticulture, Chiba University, Japan.
- Ja'afar, Nor Haslina. (2014). Karakter Fizikal Jalan Tradisional, Kajian Kes Di Melaka, Malaysia. Fakulti Alam Bina Universiti Teknologi Malaysia.
- Jacob, A. (1993). The Great Streets. United States of America: The MIT Press.
- Lai, Lee Yoke., Ismail Said., Aya Kubota. (2013). The Roles of Cultural Spaces in Malaysia's Historic Towns: The Case of Kuala Dungun and Taiping.
- Lynch, K. (1960). Image of the City. The MIT Press, Cambridge, Massachusetts, and London, England.
- Marmot, Alexi. (2002). Architectural Determinism. Does Design Change Behaviour? British Journal of General Practice.
- Meredith Glaser, Mattijs van 't Hoff, Hans Karssenber, Jeroen Laven, Jan van Teeffelen Stipo, (2012). City at Eye Level. Eboron Academic Publishers. Delft, the Netherlands.
- Moughtin, C., & Mertens, M. (2006). Urban Design: Street and Square. London: Architectural Press.
- Rapoport, Amos. (1977). Human Aspects of Urban Form: Towards a Man- Environment Approach to Urban Form and Design. Pergamon Press, New York.
- Rapoport, Amos. (2008). Some Further Thoughts on Culture and Environment.
- Stathopoulos, Ted. (2009). Wind and Comfort. Concordia University. Montreal, Quebec, Canada
- Murat Z. Memluk. (2013). Designing Urban Squares. Advances in Landscape Architecture
- Proshansky, H., Ittleson, W., Rivlin, L. (1976). Environmental Psychology : People and Their Physical Settings. New York, Holt Rinehart and Winston.
- William, Tim. (2010). Melaka and World Heritage Status. Conservation and Management of Archaeological Sites.
- Whyte W. (1981). The Social Life of Small Urban Spaces. Washington D.C., The Conservation Foundation.
- Zakariya, Khalilah., Harun, Nor Zalina., Mansor, Mazlina. (2015). Place Meaning of the Historic Square as Tourism Attraction and Community Leisure Space.
- Zeisel, J. (1981). Inquiry by Design : Tools for Environmental-Behaviour Research. California, Wadsworth Inc.
- Zhai, Binqing. (2014). Definition And Concept Of Urban Square In View Of Urban Spaces and Buildings. Xi'an Jiaotong University, PR China.
- Zucker, Paul. (1959). Town and Squares : From Agora to The Village Green. New York, Columbia University Press.