

POST-OCCUPANCY EVALUATION: THE APPLICATION OF UNIVERSAL DESIGN IN HAYRETTIN PAŞA SQUARE, ISTANBUL

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Abstrak – Ruang terbuka public yang baik adalah ruang terbuka public yang bias menampung semua aktifitas yang dibutuhkan oleh orang – orang, baik yang bersifat personal maupun kelompok. Ruang terbuka publik yang berhasil dapat diukur oleh beberapa kriteria keberhasilan (pps.org). Kriteria tersebut diantaranya dapat mudah diakses, interaktif, bermanfaat, dan nyaman. Kriteria – kriteria tersebut harus memenuhi kebutuhan manusia, termasuk orang-orang disabilitas. Bagi orang-orang disabilitas, desain universal menjadi salah satu konsep perancangan yang sesuai untuk memenuhi semua kebutuhan manusia. Desain universal mengacu pada spectrum ide yang cukup luas, bertujuan untuk menghasilkan bangunan, produk dan lingkungan yang secara umum dapat dimanfaatkan oleh semua orang tanpa batasan. Di area perkotaan, desain universal merupakan sesuatu hal yang relatif baru, oleh sebab itu penerapan desain universal di area perkotaan perlu dievaluasi, terutama pada ruang terbuka publik sebagai salah satu elemen perkotaan. Berdasarkan Organisasi Kesehatan Dunia (WHO World Report, 2011), jumlah orang disabilitas di dunia mencapai lebih dari 1 miliar, dan mereka harus memiliki keadilan sosial dan kesetaraan di ruang kota. Dalam penelitian ini, peneliti ingin mengevaluasi ruang terbuka publik yang ada dengan menggunakan metode evaluasi pasca huni menuju prinsip-prinsip desain yang sesuai dan universal dalam praktek desain perkotaan. Tujuan dari evaluasi ini adalah untuk menemukan kekurangan dalam proses desain ruang terbuka publik. Ruang terbuka publik tepi laut dipilih sebagai area penelitian karena memberikan dampak sosial dan ekonomi yang cukup signifikan bagi kawasan perkotaan.

Kata Kunci: Desain universal, Ruang terbuka publik, Evaluasi pasca huni

Abstract -- Great public spaces are where celebrations are held, social and economic exchanges take place, friends run into each other, and cultures mix. The successful public spaces are measured by some qualities keys (pps.org). These key are accessible, sociable, usable and comfortable. All of these keys should be occupy the human needs, includes the people with disabilities. For the people with disability, the universal design might be suitable to occupy the human needs. Universal design refers to broad-spectrum ideas meant to produce buildings, products and environments that are inherently accessible to both people without disabilities and people with disabilities. In urban area, universal design is comparatively new. The Application of universal design in urban area is needed to be evaluated, especially in public open space as one of urban elements. Based on the World Health Organization (WHO World Report, 2011), the world number of disable people is over than 1 billion, and they should have a social equity in urban space. In this research, the researcher would like to evaluate the existing public space using post-occupancy evaluation method toward the successful and universal design principles in urban design practice. The aim of this evaluation is to find a shortfall in public space design process. As a research area, waterfront public space is chosen because of its effect to the social and economic sector in urban area.

Keywords: Universal design, Public open space, Post-occupancy evaluation

INTRODUCTION

In general, universal design research is focusing on architectural and industrial product, unlike in urban scale which is relatively new (Southworth, 2016) (Nussbaumer, 2012). Public realm is defined as any publicly owned streets,

pathways, right of ways, parks, publicly accessible open spaces and any public and civic building and facilities. It became the part of research study in urban scale. Urban design (Southworth, 2016) draws together the many strands of place-making, environmental

responsibility, social equity and economic viability. Urban design is about creating a vision for an area and the deploying of the skills and resources to realize that vision (Davies, 2008) (Lang, 2005). The environmental making and social equity is the main aspect of this research, beside the economic viability. There are a number of models human needs, which should be accommodated in design process (Iba *et al.*, 2016).

Christopher Alexander (1997) noted that, "At the core... is the idea that people should design for themselves their own houses, streets and communities. This idea... comes simply from the observation that most of the wonderful places of the world were not made by architects but by the people" (A Pattern Language, front book flap). The people participation is needed in urban design process to occupy the human needs. PPS (Project for Public Space) has found that successful public space have four key qualities: they are accessible; people are engaged in activities there; the space is comfortable and has a good image; and finally, it is a sociable place: one where people meet each other and take people when they come to visit. Accessibility as one of an indicator in successful public space is prevailed to all people, people with disability and people with 'ability', not only by its location but also the usability of the public space.

A well-designed outdoor environment can contribute to quality of life by increasing the opportunities for activities and interests, extending social horizons, and breaking feelings of isolation from outside world. Poor outdoor design on the other hand can magnify problems of isolation, loneliness, loss of capability and reduced personal image.

As cited in Landscape Design for Elderly and Disabled, Jenks and Newman (1994) said that, "In architecture there has been a gradual realization of the importance of defining user needs more clearly, and there has been an increase of use of psychology and sociology in these subjects. There is a need of evaluation studies in outdoor design.

This research will reveal the real condition about the application of universal design principles in urban scale, especially in public open space. How far does the universal design principles are applied in this recent time and what shortages that could be inferred in existing situation to gather people with diversity.

METHODOLOGY

The researcher will use the post-occupancy evaluation technique in the case

study. This methodology consists of primary data and secondary data. The primary data could be obtained from the literature, journal, handbook, act, norm, and policy. While the secondary data will obtained with some methods, there are behavioral mapping and observations.

This methodology is belonging to the descriptive statistics where provides simple summaries about the sample and about the observations that have been made. Such summaries may be either quantitative, i.e. summary statistics, or visual, i.e. simpleto-understand graphs. These summaries may either form the basis of the initial description of the data as part of a more extensive statistical analysis, or they may be sufficient in and of themselves for a particular investigation. The Post Occupancy Evaluation Phases is depicted in Figure 1.

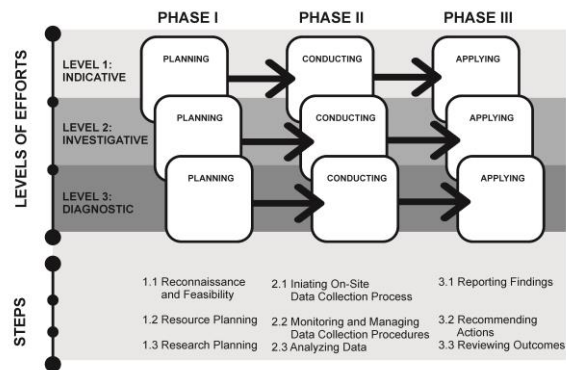


Figure 1. Post Occupancy Evaluation Process Model (Preiser, 2012)

SCOPE OF STUDY

The scope of the study is evaluating the physical elements of public open space, in this study Hayrettin Paşa square is selected as a case study as shown in Figure 2. The physical elements or the hardscape consists of the street furniture, pathways, and signage. These physical elements would be evaluated based on the universal design principles.

Hayrettin Paşa Square is located in the eastside of Deniz Museum. This square is being used for many people for some social and leisure activities, such as cycling, roller blading and skate boarding. There are also some people that only passing through this square to get to another bus stop in front of the Shangri-la hotel. Someday, this area is used for ceremonial occasion or concert. The Barbaros Hayrettin Paşa’s grave is the only preservation item that could be found in this square.



Figure 2. Evaluation study area

THEORY

Designing an open public space for various people involves searching out design solution that responds their needs. It is essential for designers to be aware of characteristics and lifestyles associated with disability and ageing and in particular the effects of these have on the way that people use their environment.

The American Disability Act (ADA) protects individuals with disabilities. The term disability can often be misunderstood; therefore, the ADA developed the following definition:

A physical or mental impairment that substantially limits one or more major life activities of such individual

A record such an impairment.

Being regarded as having such impairment.

For better understanding the various definitions of disabilities, the following explanation would be clarified;

Physical impairment

A physical impairment is defined a physiological disorder, cosmetic disfigurement, or anatomical loss affecting one or more body system such as speech, hearing, and speech impairments, as well as mobility or dexterity loss. This may include medical conditions such as cancer and diabetes.

Mental impairment

A mental impairment is defined as mental or physiological disorders such as emotional or mental illness, specific learning disabilities (e.g. dyslexia), and more.

Substantially limits

Substantially limits means that for an impairment to be considered a disability, it causes the individual to be unable to perform, or be significantly limited in performing, one or more of the major life activities.

Major life activities are walking, talking, seeing, hearing, breathing, and caring for one, and so on. For a disability to be covered by ADA, the impairment must substantially limit one or more major life activities. It also includes activities such as performing manual tasks, eating, standing, lifting, reading and more. Besides that, the functions of immune system, normal cell growth, neurological, respiratory, circulatory body functions are to be considered too.

On the other hand, Central Public Works Department (C.P.W.D.), Ministry of Urban Affairs and Employment, India, have been considering while preparing the guidelines for barrier-free built environment are broadly classified under four categories:

Non-ambulatory: Impairments that, regardless of cause or manifestation, for all practical purposes, confine individuals to wheelchairs.

Semi-ambulatory: Impairments that cause individuals to walk with difficulty or insecurity. Individuals using braces or crutches, amputees, arthritics, spastics and those with pulmonary and cardiac ills may be semi ambulatory.

Sight: Total blindness or impairments affecting sight to the extent that the individual functioning in public areas is insecure or exposed to danger.

Hearing: Deafness or hearing handicaps that might make an individual insecure in public areas because he is unable to communicate or hear warning signals.

One of the common and most restricting disabilities experienced by people with different ability is reduced mobility. Some of them often walk slowly and cautiously. Many have difficulty in managing changes in level or long distances. Falling is especially dangerous as fractures take much longer to heal or may lead to further problems.

Public Open Space

Square is a local facility, most of people uses it for many activities. Some of it is connected with transit point and commercial area. The square should be designing inclusively because it is will be accessed by many people with many different background.

Also while it used for tourist destination and transit point.

An inclusive open public space should have a design consideration in design process. It must following the main principle of responsive, adaptable, and accessible. Those main principles are extracted from the universal design principles and inclusive design principles

which both of it have the same purpose and similar meaning.

The basic design criteria below is merging from some resources, such as United Nations barrier-free built environment guidelines, Hamilton City Free-Barrier Guidelines, and a research report from Miyake (Universal Design Handbook, 1st edition, 2010).

Table 1. Urban Design Criteria for Universal Design

Item	No	Urban Design Criteria for Universal Design
OBSTRUCTION	1.	Obstructions are placed outside the path of travel wherever possible.
	2.	Obstructions in the pathway are easy to detect and they are placed along one continuous line.
	3.	The minimum width of a clear unobstructed path is over than 0.90 m.
	4.	Overhanging signs and tree branches in accessible pathways are mounted at a minimum clear height of 2.00 m to allow a sightless person to pass safely.
	5.	Bollards are painted in a contrasting color or in colored stripes.
	6.	The distance between guiding posts are around 1.20 m.
	7.	Manholes, drains and gratings are placed outside the pedestrian pathway.
	8.	Garbage bins attached to lamp posts not face the line of pedestrian flow so as to minimize collisions and painted in a contrasting color so that people with limited vision may easily identify them.
	9.	At a shoreline, access is provided as close to water as possible.
	10.	A railing and a fishing rod holder are provided in a fishing area.
	11.	Fixed poles should have contrasting durable color marking strips of at least 0.30 m in length, placed with the center line at a height between 1.40 m and 1.60 m, to warn pedestrians with limited vision.
SIGNAGE	12.	All types of signs are visible, clear, simple, easy to read and understand, and properly lit at night.
	13.	Signs are not being placed behind glass because of possible reflection.
	14.	Pathways with stairs, a signed is provided in advance to inform its existence.
	15.	Signage placed on the pedestrian path is considered obstructions; thus, they should be detectable.
	16.	Shape of signboards: <ul style="list-style-type: none"> • Information signboards are rectangular. • Warning signboards are triangular. • Interdictory signboards are circular.
	17.	The color of signs contrast with the surrounding surface so as to be clearly distinguishable.
	18.	The commonly used colors are: white, black, yellow, red, blue and green.
	19.	The color combinations red/green and yellow/blue should not be used in order to avoid confusing color- blind persons.
	20.	The sign surface is processed to prevent glare.
	STREET FURNITURE	21.
22.		Some seating accommodations are being placed close to public toilets, telephones, etc.
23.		Resting spaces with benches are allow a minimum of 1.20 m of adjoining space for a wheelchair
24.		Public seats and benches are approximately 0.45 m above floor level, with backrests at approximately 0.70 m above floor level.
25.		The telephone booth is accessible and has sufficient floor area for wheelchair users.
26.		Placing a telephone along a pathway is desirable for emergency use
27.		Accessible public telephones are marked by appropriate signs.
28.		A folding seat is provided in accessible telephone booths for the convenience of people with mobility problems.
29.		Telephones for the hearing impaired are equipped with hearing aid devices and amplifiers and the location of telecommunication devices are indicated by signs.
30.		The coin slot is mounted at an accessible comfortable height between 0.90 m and 1.20 m.

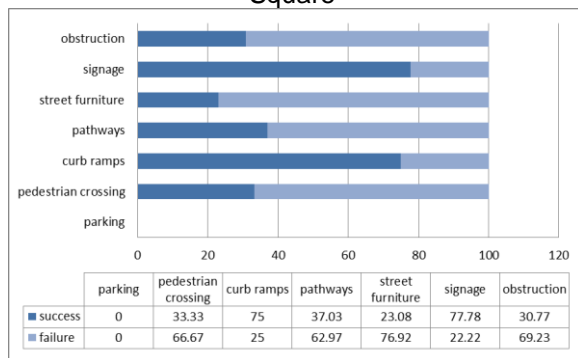
	31.	The bus stop areas are equipped with a roof and bench.
	32.	Guiding blocks for persons with impaired vision.
	33.	To make a counter easily accessible for a wheelchair user, allow a space about 700 mm high and 350 mm deep under the counter.
PATHWAYS	34.	The pathway width is enough to allow wheelchair user to turn a right-angled corner with ease.
	35.	The pathway width is enough to allow wheelchair users to pass each other
	36.	The path of travel should be easy to detect by a sightless person using a long white cane. Natural guide lines and guide strips are used to help identify travel routes.
	37.	Guide strips are laid in a simple and logical manner and they are not being located close to manholes or drains to avoid confusing sightless people. Guide strips have a color which contrasts with the surrounding surface for the benefit of people with sight problems.
	38.	Where travel routes change direction, there is a gradual change in the direction of the guiding strip.
	39.	A tactile guiding area, preferably of rubber tiles with minimum dimensions of 0.90 m x 0.90 m, it is constructed in a guide strip at cross pathways where the route branches off in several directions.
	40.	Tactile tiling on the pedestrian route of travel is being placed at the following locations: <ul style="list-style-type: none"> • On a guide strip where alternative routes exist or at a junction of guide strips • At a pedestrian crossing • Around obstructions which are difficult for the sightless to detect
	41.	The surface of an accessible pathway is smooth, continuous, non-slip and even.
	42.	Pathways which are level and even with adjacent surfaces should be given a different texture and color finish for differentiation.
	43.	Intersecting pathways is blend at one common level
	44.	Manholes, drains and gratings are being placed outside the pedestrian pathway.
	45.	Gratings should be flush with the pathway surface and they have narrow patterns of not more than 13 mm.
	46.	For changes in level of more than 13 mm between the pathway and the surrounding surface, guards, up stands or other types of barriers must be used.
	47.	Pathways edges are provided, where necessary to protect wheelchair dropping off.
	48.	The edges of the pathway must be beveled wherever changes in level between 6 mm and 13 mm exist between the pathway and the surrounding area.
	49.	Not using trees with shallow roots which are hazardous as the roots may breakthrough the pathway surface.
	50.	Crushed stone, gravel, etc. are not used so that wheels are not stuck or get flat tires.
	51.	The joint of surface material is finished smooth with minimum recess and minimum width.
	52.	When dust is used, proper drainage is necessary to prevent a muddy condition.
	53.	It is preferred to use a surface material that makes desirable when walking on it.
	54.	Surface materials of the main pathway and those other pathway are different.
	55.	Not use of too many different of surface material which may cause confusion.
	56.	Braille or other tactile signage is provided at the top end and the bottom end of handrails.
	57.	The surface material immediately before the first step and immediately after the last steps is different from that of other portions to warn users. In the case of wide step, the surface material of the edged is different from that of other portion to warn user.
CURB RAMPS	58.	For narrow pavements lowered at a corner, the tactile tiling indicating the location of the pedestrian crossing must be constructed.
	59.	Effective lighting is provided so that each step can be recognized with ease.
	60.	Curb ramps are used wherever there is a difference in level on pedestrian paths or cross paths.
	61.	The level difference at a slope curb is less than 1cm.
	62.	Curb ramps are located away from places where water accumulates.
	63.	The maximum slope of a curb ramp should be 1:12.
	64.	
	65.	

	66.	Curb ramps, including flares, must have a rough texture or ground pattern to make them detectable and slip-resistant.
	67.	The surface color must be distinct and contrast with the surrounding surfaces to guide pedestrians with limited vision.
	68.	The minimum width of a curb ramp should be 0.90 m, excluding the sloping sides. The recommended width is 1.20 m.
	69.	Stepped curbs must be avoided, as they are hazardous to all pedestrians, especially in darkness.
	70.	A guide strip is lead to pedestrian light poles with push buttons for the benefit of the visually disabled.
	71.	Pedestrian traffic lights are being provided with clearly audible signals for the benefit of sightless pedestrians.
	72.	Push buttons are easy to locate and operate and placed between 0.90 m and 1.20 m off the ground for the benefit of wheelchair users.
	73.	The width and depth of a traffic island must not be less than 1.50 m.
	74.	A colored tactile marking strip at least 0.60 m wide must mark the beginning and the end of a traffic island, to guide pedestrians with impaired vision to its location.
	75.	The road surface must be firm, well-drained, non-slip and free of construction joints
PARKING	76.	The minimum width of an accessible parking space is 3.60 m. The recommended width is 3.90 m.
	77.	Accessible parking areas must be marked by the international symbol of accessibility.
	78.	Parking is for exclusive use by drivers in wheelchairs is provided near the park and major facilities of the park.
	79.	Smooth and safe travel, without a change in level is secure from the park to parking area
	80.	The park is located in the vicinity of the nearest public transportation station

RESULTS & DISCUSSION

This square were evaluated in some difference time and date by using a behavioral and physical mapping technique and as the result is shown in Table 2.

Tabel 2. Evaluation Result of Hayrettin Pasa Square



Place centered mapping technique is used in this evaluation process to find out the activities that could be found in this area. The activities that can be found in Hayrettin Paşa square are:

- Sitting
- Passing through
- Parking car
- Skating
- cycling

- Taking photo
- Waiting bus (IETT 30M)
- Sleeping (homeless)

Those activities very important to describing the standard of public open space should be and in this research the universal design is chosen to fulfill the requirements for success public open space.

Based on the urban design criteria for universal design, in the Hayrettin Pasa square found some lack of design that could be describing below:

Obstruction

In the obstruction item, the evaluation result shows that the failure percentage is bigger than the success percentage. The reason that makes this item obtaining low performance is the presence of some obstacle in some point and the obstacle that does not meet with the criteria. Based on universal design principle, this item does not appropriate with the tolerance for error, low physical effort, and size and space for approach and use principles (Preiser, 2012) , where people with disabilities still have to be careful while doing their activities in this area.

Signage

Based on the evaluation result for this area, the most crucial problem is the signage

that is not clear at night and unreadable for some people, especially people with low visual impairment. Signage includes the item that does not have much failure in this area. The perceptible information principle has been applied, even though the tolerance for error (Preiser, 2012) should be considered for future development.

Street Furniture

In this item, the part that have many note is the placement of the benches, ticket counter, and telephone booth. The placements of the benches which are not accessible and do not accordance to the criteria reduce the value of this area as a whole. Besides that, the public facilities, such as public telephone and ticket counter do not support the disabled people's need as figured on the criteria table. The benches are not arranging in the repetition range than it should be, and the public telephone does not comply the standard for disabled. As a conclusion, the universal design principle, especially the equitable use, flexibility in use, and simple and intuitive principle (Preiser, 2012) still ignored in this area.

Pathways

In this square, the evaluator divided pathways into two different parts. One is the outer part which is bounded by the difference level height and balustrade, the other part is the hardscape inside square. The adequacy of space for wheelchair user, safety, and guiding block (strip tile, tactile tile) became a particular concern in this area, especially for the outer part (pedestrian). The percentage of success value is not much significant toward the percentage of failure value; it is 37% and 67%. The west part is more accessible than the east part, whereas the north part should have more concern because near to the main street and has a difference height level toward the main square. So, the safety should be improved in this part. In the east part, the pathways mingled with the buffet, shelter, and ticket counter, so it could be an obstruction for the pathways user. Generally, some universal design principle does not fulfilled in this item, those are equitable use, perceptible information, low physical effort, and size and space for use approach principles (Preiser, 2012).

Curbs Ramps

Generally, the failure for this item is not recognized. The minus value for this item is

only the using of return curbs ramp (ramp without flare, the safety for long ramp, and the finishing of ramp (include colors and materials).

Pedestrian Crossing

Technically, the main failure in this item is the crosswalk signals which not available in every pedestrian crossing. It makes people with disabilities getting difficulty to passing the crosswalk area.

Parking

In this area, the official parking park is not available, so all the statement figured in the table is irrelevant. But some people use this square as an unofficial parking area. The using of square as a parking area is harmful for the square user, because their movement as dynamic as the vehicle movement. So it could create a hesitation for the user while they have to pass within the vehicle movement in the same area, especially people with wheelchairs, elderly and people with low visual impairment. Aside from the irrelevant statement, the universal design principle does not fulfilled in this square.

CONCLUSION

As a whole conclusion, Hayretin Paşa square has a 30,7% of success percentage based on urban design criteria for universal design and as a whole could be explained that this square does not comply with the universal design principles. An obstruction, street furniture, pathways, and pedestrian crossing became items that have major failure in this area. Descriptively, the presence of informal parking area should re-evaluate in future development.

As stated in the scope of study, this study is only evaluating the physical element of public open space in order to create an accessible built environment. The government who has an authority for this square should consider the smallest thing for the future development, including the arrangement of street furniture, colors, and the dimension as a consequence of this evaluation result. By combining this result with another evaluation variable and parameters, the government could create a successful and sustainable public open space in order to improve the quality of live and index of happiness of the society. Another thing that should be considered while designing this public open space is the circulation of human and vehicle. The space organization and zoning is also important in order to accommodate the human needs and activity in urban scale. As a

conclusion, the universal design itself is only a variable to create an inclusive city, in this case is public open space. The universal design principles are used as parameters to evaluate the physical elements of public open space in order to fulfill the key elements of successful public space, the accessibility. Other key elements could be included in another future research in case of how to attract people to use a public space.

In the other hand, this research is using an Indicative POE as an evaluation tools. In my opinion, this method is enough to indicating the major failure and evaluating the accessibility of public open space towards universal design principles. This tool is relatively saving the time, easy, simple, and inexpensive, but to obtain better result, the design criteria should be reviewed again by pre-research related to the human needs adjusting the surrounding culture and environment. The design criteria could be developed in to some specific items.

RECOMMENDATION

For further research, an evaluation study is not only bordered in a physical elements of public open space to creating a successful public open space, but also pre-research on human needs and behavior as well as combined with wider data to get more detailed design parameters is necessary to be considered to obtain more significant results. Post-occupancy evaluation as used in this research could be improved into higher level; it could be investigative POE or diagnostic POE where both of it involving the user directly.

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