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HOW BLIND PERSON UNDERSTAND THE ARCHITECTURE OF SEKOLAH LUAR BIASA (SLB) CASE STUDY: BLIND PERSON AT MTS YAKETUNIS

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ABSTRACT
Architecture is constructed for fulfill its inhabitant's activities, therefore all architecture's elements such as space, horizontal and vertical wall, opening, color and etc., have to work together to fulfill the good manifestation of functions or activities. People (the inhabitant) are the central of functions or activities, therefore it is essential to understand the user, and this research that focused on Blind person and taken place at Sekolah Luar Biasa (SLB)/extraordinary school is purposed to find basic characteristics of user (in this case is blind person) during their interaction with architecture. It is also hoped to be useful information on creating better and more suitable environment for them. The observation and interview done during the research has been record several interesting facts, such as the way the walking through the corridor, arranging the information about rooms, and the way to find each room. This information will help architect to design a building for blind person.

INTRODUCTION
Character and attitude of a person is constructed both as inheritance and as the result of its environment's-including architecture-influences. As an art, architecture is not only an effort for accomplishing functional requirements but also a physical embodiment of architecture as a container of human activities (Ching, 1996). This physical embodiment will involve a lot of architectural elements such as materials, colors, sounds, textures, light, and even space itself. Each elements affect architecture differently, as described below:

a. Material
Material is a significant element of construction which gives the skin or message of architecture and influences the shape and quality of space. Related to the interaction between architecture and its users, material—with its textures and composition, or color and smell—will stimulate users' behavior. The habit of a person walking on wood floors, or reinforced concrete, or steel sheets will be very different depended on attributes such as elasticity, sound, and the heat absorption rate.

b. Sound
The sound can be as strong as the light in identifying the place. The place can be distinguished from noise or effect of the sound they make. A place may be distinguished by the sound of wind in the leaves of trees or the sound of a fountain or water flow. A particular place in the city could be associated with the music of a musician played there. A spot—like exam room or the library or the dining room of a monastery—which may be distinguished by the silence; or a restaurant with its background music (Unwin, 2003).

c. Smell
A place can be identified by the smell and the smell can make the place. Not only could be fun, but smell could also be disgusting. Strong smell can beat all spatial aspects and make it does not fun to stay in a place. Unwin (2003) gives a few examples of place that can be identified from its smell. He said: "the character of an old library, in part, is because of the smell of polished wood and leather binding of the book; and an artist studio with the smell of oil paint. An eating place in department stores produces the smell of roast, fine cheeses, and freshly baked bread. Chinese temple is surrounded by the smell of burning incense. Teen bedroom may be distinguished by the smell of the old stuff shirts or deodorant. Different parts of a garden may be distinguished by the perfume of roses, honey, jasmine, and lavender". From the few examples above, we will agree and optimistic that the 'smell' is an element that can be modified to create a universal architecture design.

d. Color
Color is not only related to the decoration or the creation of a place with a particular atmosphere. Color can also be used to identify the place, divide the space into regions and zone, and can change the focal point in the room. The ceiling in white room with black floor will appear higher than if the colors are applied upside down. Similarly, with a room that is painted green, blue room with electric light or room lit by sunlight through stained glass windows will also have a different character. Colors influences the way we perceive the boundaries of space. Rooms with low contrast colors will give the
impression of larger and bigger because the distance between observer and structural surfaces and dimensions cannot be clearly identified and vice versa. Various colors and different light qualities can also show different moods (Unwin [2003], Ehn [2009]).

Color is also used as the symbol. In directing someone to your residence, you might describe it as a house with red (blue, green, or any color). A colored line can also show certain pathways, a place where you have to wait, or to help people find the way (Unwin, 2003).

h. Scale

The scale is a relative measure. In architecture, scale has a different meaning but still related to the relative size refers to the size of the human body or the so-called human scale. Radically, the scale is able to influence the experience of a particular space. For example, a football field and a small patch of grass in the back garden will have a different experience of space because their scale is different even both covered with grass (Unwin, 2003). The influence of environment becomes important topic learned in environmental psychology by architect or psychologist.

Elements above are also important to be understood by architect for supporting human performance. Human performance, as Steinfield (2012) explain, is the ability of people to complete activities and tasks. For reaching the well functional architecture of Sekolah Luar Biasa (SLB/ Extraordinary Primary School), the government through the Minister of National Education Directorate issued an infrastructure Standard Regulation No.33/2008. Directorate of Extraordinary Education, Ministry of Education and Culture, also issued some guidelines related to Special Education including Technical Guidance for Extraordinary School Building through their official website (http://www.sitpib.or.id). Both of these documents are the guidance for architect/planner to achieve effectiveness and efficiency of education through produce the design that is functional, reflecting the general and specialized characteristics of education, and low-cost maintenance.

in the case of accessibility standards for the blinks, that have to be covered by the school, two regulations above the Regulation of the Minister of Public Works No.30/PRT/M/2006 have been shown the needed instruments, such as pedestrian paths, parking areas, doors, and etc. But, it doesn’t present the possibility of architectural design exploration as well its interaction with the user. Therefore, universal design was developed to be more user-based design and at the same time still give the room of creativity for designer/architect.

What this research did is recorded and analyzed how users (blind student and teacher) actually understand the school’s architecture. This study asked and formulated specific characters of visual impairment students in their process of reading architecture; and also identified architectural elements that help the learning process, the perform of effective and efficient activities, and also the positive experiences gained. The finding of research is the manifestation of—what called by Steinfield (2012) as—four key bodies of knowledge that come into play on human performance; those are anthropometry (body fit), biomechanics (comfort), perception (awareness), and cognition (understanding).

METHODOLOGY

The study was conducted through four stages as follows:

1. Stage 1 - Preparation

At this stage, several activities are done such as:

a. The study of literature

Many studies of components of the architecture, accessibility issues, and physical character of human psychology (particularly children learning age) conducted by researchers from various fields. The results of this study are used as reference or even provoke the birth of ideas in research.

b. Preparation of materials and research equipment. SLB selected as the locus of this research is Islamic Junior High School (MTs) Yaketunis located at Jalan Parangtritis 46 Yogyakarta. The first task undertaken was re-measurement and depiction of existing conditions (floor plans, elevations and pieces of the buildings). Plan will be key questions in this study.

Figure 1. Atmosphere of Existing MTs Yaketunis
(Source: documentation, 2012)
2. Stage 2 - Field Survey

a. Observation

In the observation phase, the activities were focused on student behavior and their interaction with MTs Yaketunis architecture. But in its development, the observation was also carried out on a blind teacher. These observations took on number of students as the observed objects with the method of person-centered map (by using 2 camcorders, cameras, and direct observations) to recorded and documented any activities undertaken within a certain period.

In the process of research, observation was focused on areas outside the corridor in front of the first floor classrooms contact with teacher’s room, computer lab, library, toilets, dormitories, parking, and entrance hall. The selection is due to several reasons, namely:

i. Most of activities around the school were in the first floor corridor

ii. More dynamic activities were done along this corridor.

In addition to limitation of observation area, observation time was limited too that is only at break times are at 09:40 to 10:05 and 11:35 to 12:15 where the activities were done outside the class.

b. interview

The interview process became verification and deepening process against the observations result. This process is done to the students and teachers who became the object of observation.

3. Stage 3: Analysis of data

Analysis the results of the field survey will lead to three things, namely:

a. An analysis of the individual characters of blind student to learn visually impaired student attitudes toward their school.

b. An analysis of the architectural elements that actively responded by the students SLB

c. An Analysis of the interaction of students and their SLB architecture

4. Stage 4 - Writing

Writing stage was a collecting process of the survey results and discussion (analysis) systematically according to the research objectives.

RESEARCH RESULTS AND DISCUSSION

1. Character of Blind Students

Blind is part of different ability (difabled) community who has different way to solve a problem. It can be defined as a group with significant limitation of visual capability that can be caused by illness, trauma, a derivative or degenerated condition that cannot be corrected by conventional means, including medical or surgical (Kurniawan, 2011). Limitations of this group can be understood through multiple conditions (Kurniawan, 2011) such as:

a. Difficulty on getting the details of the environment, where it look like a foggy environment.

b. Only able to observe large objects or simply recognize the shadows and light.

c. Glare from the shiny floors and walls with high reflectivity, such as direct or bright light from window.

d. Not being able to see in low light conditions.

But even they have similar general limitations; each blind person has different level of ability and characteristic. As the result of observation and interviews, all objects could not be generated into similar result. This diversity appears to be strongly influenced by the ability of each individual taken, for example Jamil, could be said, had a very unique ability. During observation, especially in the Saturday, November 10th 2012, where sports activities performed, Jamil participated actively in the football game with other three students and two low vision students. In the record, it does not look that Jamil (see figure 3). Jamil is a student dressed in a green sports/second person from the right) has limited movement because of his eyesight, even on the contrary, Jamil’s move as active as students with low vision. Jamil has a sensitivity to the weather, the wind, and the sound so it never hit the running though. Dita, as in an interview, also still has the ability to see the light. This capability makes her still could find out if there is an object in a place as a shadow, although it cannot clearly describe the object.
2. Mobility

a. Path of Movement
Observations indicated that the pattern of straight movement is done by almost all observed objects. The difference was lied in the position of the movement occurred that there are movement in the middle of the corridor and also on the side of the corridor (near the wall). Another thing that can be observed is that the movement pattern of visually impaired student is look much simpler than low vision student. The decision to move was based on a very predetermined goal, so that movement is very efficient and without the exploration of space. For example, blind students who walked toward the class from dormitory is walked straight along the corridor directly to the classroom. Interruptions that arise along the way (like a call from a friend in another class) responded with a pause (transit) corridors or sit on the bench just for a while.

b. Mobility Behavior
Some behaviors are found during the observations, those are:
1. Greeting the wall while walking or when looking for something or try to find room/object around them (Figure 5).
2. Tending to walk in the near side of the wall.
3. Walking slowly, especially when pass through the class or group of friends.

Those characters show how collecting information is a different activity for the visually impaired person. Pasinini (1984) in his book ‘Wayfinding in Architecture’ explains the way blind people read their environment. He said that the blind, even though that was never seen, is capturing the environment in terms of cognitive maps. When the blind finds their way, he does not only replace visual information into non-visual information, but also he had to organize the information in an orderly fashion.

Figure 5. Few visually impaired students look touched the wall when the mobility in this corridor
(Source: documentation, 2012)

Thomson, et al (1984) said that the main requirement for totally blind people is the non-visual clues such as the change in surface texture, embossed letters and appropriate acoustics, while people with limited vision (partially sighted) can depend on a lot more user-visual clues and can benefit from direct light or lighting designed, large font and color codes.

3. Element of Architecture

a. Room Layout
The MTS Yaketunis’ room layout which is simple and arranged linearly allows blind students and teachers to memorize the order of room arrangement easily. Memorizing room arrangement has become a method for blind students and teachers here to find the room. Mrs. Atun (one of blind teacher), in an interview, for example, mentioned the room arrangement as follows:

“From the gate to the left, there is the head of school office, teachers’ offices, IXB class, VII class, VIII class, stair, computer room, library, prayer room. In the east side there is a bathroom, a kitchen, girl’s room, music room, hall, IXS room—but not yet arranged, and message, bathroom, garage in that corner. Above, there is the hall, recording studio, IXA class, language laboratory.”

Mrs. Siti (blind teacher) described the layout as follows:
CONCLUSIONS AND SUGGESTIONS

Conclusion:
1. The proximity of the student/teacher with the school buildings has big influence on the patterns and behavior of mobility.
2. Even it is useful in general, but adding auxiliary instruments such as guiding block do not become the main instrument for the mobility.
3. The linear room arrangement is very helpful to memorize the position of a room to another room.
4. The implementation of architectural elements such as doors, windows, and walls can be used as a marker of the room.
5. The uniqueness of each individual ability also conducted different behavior detailed during mobility.
6. Fingered behavior becomes major activity undertaken to determine the room marker, the objects around them, as well as help them to perform smooth movement.

Suggestions:
1. Research can be carried out with experimental or comparative method (by bringing students to a new location or change the existing condition MTs) to see the consistency of behavior and adaptations made.
2. Interview should be conducted more intense due to the proximity between researcher and student/teacher is highly influential. The limitation of interviewing time also restrains further questions exploration.
Figure 6. Observation Document

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