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Layout Furniture in Supporting the Visually Impaired People at the Dining Area of PSBN Wyata Guna

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ABSTRACT

The dining room at PSBN Wyata Guna is used for visually impaired people when it's time to eat in the dining room. This room has high potential complexity and level of activity. Because of the activities that occur, the movement of visually impaired persons is essential in this dining room. But the lack of treatment in the dining room causes frequent collisions and difficulties for the visually impaired person in finding directions. Therefore, we need a stimulus that can support the movement of the visually impaired person in circulation. Through previous research, stimuli that play a high role are sound and layout. This study uses an experimental method to determine how significant the layout and sound stimuli are for visual impaired person in circulation. And it has been concluded that distance is not significant to determine the time of movement in circulation in the dining room, the most important thing for people with visual impaired person is the instructions located in the area of circulation and sound stimuli which are located at critical points. The instructions referred to can be in the form of furniture or other objects if they do not inhibit circulating movements and have a consistent distance, while sound is needed to convince persons with disabilities that their direction is correct. Furthermore, this research can be a recommendation for further research, both academics and related institutions as well as input for interior designers and architects in designing dining rooms for persons with disabilities on a small scale.

Keywords: visually impaired people, layout, sound stimuli, and space circulation

INTRODUCTION

In the table of estimates of the number of people with visual impairments and low vision by province, processed by the Pusdatin of the Ministry of Health, and published through Situations of Visual Disorders and Blindness in 2014, West Java ranks third with the highest number of people with visual impairments in Indonesia. West Java has an orphanage for people with visual impairments in Bandung, namely the Bina Netra Wyata Guna Social Home, this orphanage has a noble goal but is constrained by several problems: the lack of adequate space for people with visual impairments and the available space elements are not suitable for their needs.

In the process, it has been concluded that the primary senses used in finding direction are the senses of hearing and touch, and in making interior designs for people with visual impairments, objects to be touched and sound sources are needed to convince people with visual impairments that the direction is correct and safe. To ensure this, an experiment is needed in the Wyata Guna PSBN dining room. This experiment aims to find out the best layout system for visually-impaired objects such as furniture and other interior elements.

In addition, from the results of observations and interviews that have been carried out in previous studies, it was found that the type of layout that most facilitates people with visual impairments in carrying out their activities in this dining room is a layout with a circulation area that has no obstacles and an activity area that is close to the entrance area or circulation area. . In this experiment, it will be tested how people with disabilities choose a seat to eat and how sound affects their movement. This test was carried out on 20 people with visual impairments from different dormitories and carried out in the

dining room of the Bina Netra Wyata Guna Social Institution. The focus of this test is how people with visual impairments find their dining table, how much noise affects their mobility and what difficulties people with visual impairments face in each condition.

The Basic Concept of People with Visual Impairments

Etymologically, the basic concept can be interpreted as "a person's mental picture of something," while the basic can be interpreted as "something fundamental or underlying something" (Majerova, 2017). So it can be concluded that the basic concept is a fundamental mental picture of a person and must be studied and known. (Directorate General of Social Services and Rehabilitation of the Ministry of Social Affairs of the Republic of Indonesia on Orientation and Mobility Guidelines for Social Institutions for People with Visual Disabilities, 2002). The types of basic concepts according to the Directorate General of Social Services and Rehabilitation of the Ministry of Social Affairs of the Republic of Indonesia are:

1) Motor perception component; use of other senses such as touch, smell, hearing, and proprioception.
2) Body concept/body image, size, shape, surface, color, weight, location, use, position, movement, time, sound, taste, smell, direction, motor, space between objects, and the concept of the relationship between self and object.

Hence visually impairment person has a functional constraint of their visual ability that may be described by inevitable vision loss, restrained visual field and diminished contrast sensitivity, elevated sense to glare as well as diminished ability to show activities of daily life activities (Naipal and Rampersad, 2018). Visual Impairment person can recognized sound, touch, and smell into a complex sensorial perception to describe objects (Oteifa, 2017).

Organization – Spatial Organization

The following are the types of the spatial organization according to Francis D. K. Ching in Architecture: Form, Space, and Order, 2007, third volume:

1) Linear Organization
   A linear organization consists essentially of a series of spaces. These spaces can be directly related to each other or linked via a separate and remote linear space.
2) Radial Organization
   A radial organization of space combines elements of both linear and centralized organization. This organization consists of a dominant central space from which several radially linear organizations protrude.
3) Clustered Organization
   A clustered organization relies on physical proximity to link its spaces to one another. This organization consists of repetitive and cellular spaces with similar functions and standard visual identifiers such as basic shape or orientation. Because there is no critical place of formation in the pattern of a clustered organization, the importance of space must be emphasized through its size, shape, or orientation in the pattern space must be noted through its size, shape, or direction in the pattern.
4) Grid Organization
   A grid organization consists of shapes and spaces whose positions and relationships are governed by a three-dimensional pattern or grid area.

Wayfinding

Wayfinding is the process of determining and following a path or route between a starting point and a destination. Wayfinding is a purposeful, motivated activity that can evidence sensorimotor action in the environment. In humans, the primary purpose of wayfinding is to find an accurate way from one place to another that is intentional and cannot be accepted spontaneously.

METHODS

Critical senses used in finding direction for visual impairment person are the sense of hearing and touch (Hasling and Ræbild, 2021). Objects that is touched and sound that is heard are needed sources to

convince people with visual disabilities that their pathway is right and secure (Fransisca and Tedjokoesoemo, 2018). This research was conducted using experimental methods. The experiment was carried out in the dining room outside of lunch hours, the reason being so as not to interfere with the usual lunch activities. In addition, this experiment does not use the entire area of the dining room. It is enough to use the site in the corner of the room measuring about 40 m², below is a floor plan of the dining room, and the red box is the area where the experiment was carried out.

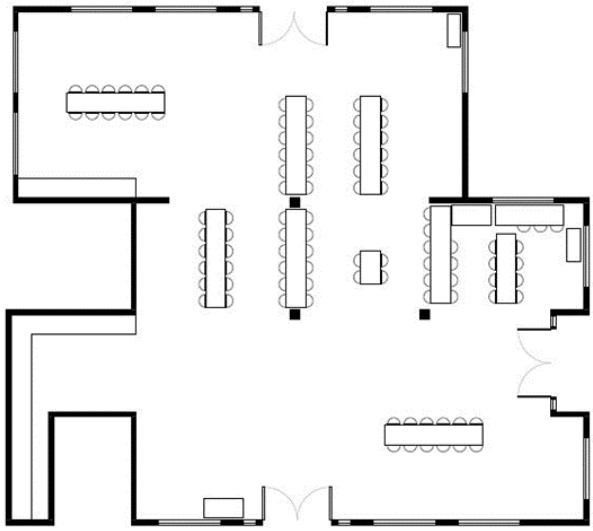

Figure 1. Existing Dining Area Plan
(Wasilah, 2019)

The layout for this experiment also doesn't change the existing layout too much. The layout for the experiment consisted of 2 tables and four long chairs, with 1 table closest to the entrance. In addition, between the two tables, a sound source is placed, and for condition A on the right side of the exit, a sound source is also placed, figure below will explain the layout:

Figure 2. Experimental Plan
(Wasilah, 2019)

There are two groups for this experiment, and it is divided into ten people with visual impairments. Each 1 group describes one condition that will be in the experiment. The flow of this experiment is that initially people with visual impairments enter one by one and walk towards the serving table which is in a straight line with the door which is about four meters away. Then the sound source is sounded, and the blind person starts walking to find the seat they want with the voice prompts. After finishing eating,

one by one people with disabilities came out through the exit door, for ten people with visual impairments who were in the experimental condition A would hear the sound again near the exit and walk with the sound instructions. Observations were made using a camera placed in a certain position, to record all movements of persons with visual impairments.

RESULTS

Condition A

There will be ten persons with visual impairments in condition A. The sound source in this condition will be placed in 2 places, namely between the two dining tables and near the exit. The following is the overall circulation and the point of crowding in condition A and the point shows where people with visual impairments sit down to eat at the dining table.

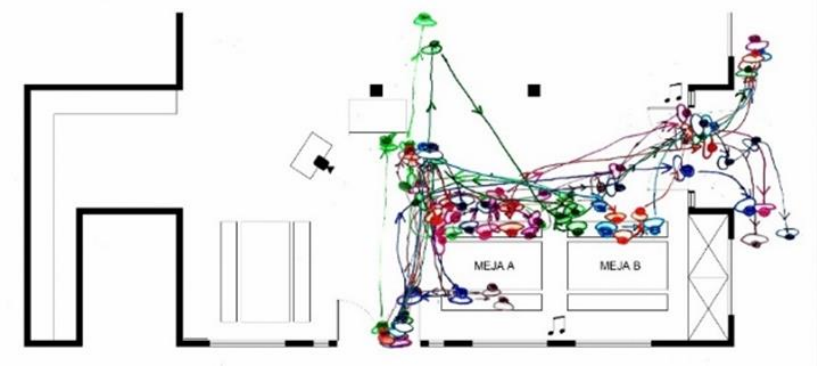

Figure 3. Center of Crowd and Circulation in Condition A
(Wasilah, 2019)

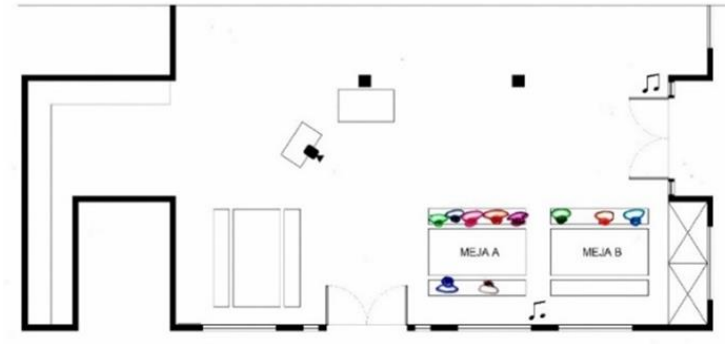

Figure 4. Seating Point for Persons with Visual Disabilities and Photos in Condition A
(Wasilah, 2019)

In the figure, it can be seen that table A has the most crowded point. In addition, it can also be seen that the area near the exit is the most crowded, namely the area near the sound source. In addition, seat 1A is the most crowded seat to sit on because of its position closest to the serving table. Seat 1A is also a point where blind people in condition A often stop because they hit this chair, this is because blind people want to follow the sound source between the two tables, for more details, see the image below:

Figure 5. The first point visited by people with visual impairments and photos in condition A (Wasilah, 2019)

After eating they went out one by one through the exit on the right. From the previous picture, it can be seen that the crowded point on the way to the exit is the point that is around the sound source, here is a picture with only the person points:

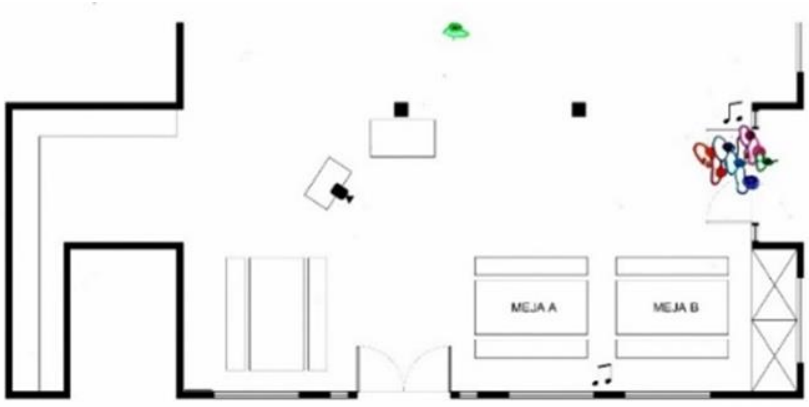

Figure 6. The last point visited by the blind person in condition A
(Wasilah, 2019)

After seeing the results above, it can be concluded that the most crowded point in condition A is seat 1A, and the corner of the exit is close to the sound source.

Condition B

There are 10 people with visual impairments who are respondents in condition B. In this condition, the sound source is only placed between the two dining tables. The following is the overall circulation and crowd points as well as points for people with visual impairments to sit down to eat at the dining table in condition B:

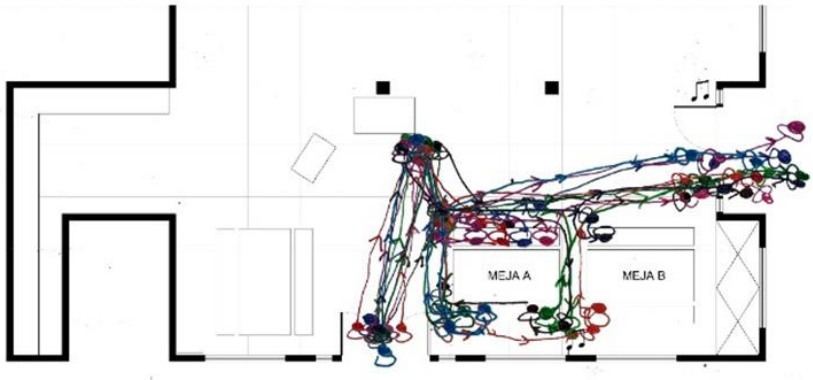

Figure 7. Crowd Point and Circulation Condition B
(Wasilah, 2019)

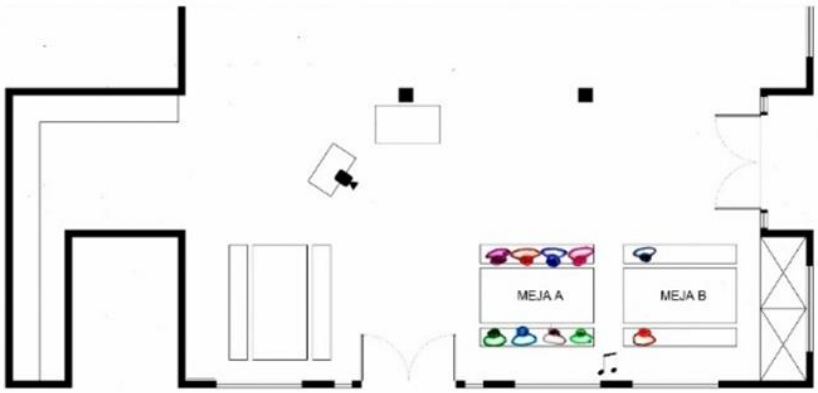

Figure 8. Seating Point for Persons with Visual Disabilities in Condition B
(Wasilah, 2019)

In this condition, table A is still the most crowded table, but the point of crowding that occurs at the exit has moved to the right side of the door which is close to the dining area. Conditions B and A have differences in the flow towards the dining area, in condition B the respondents tend to look for the dining table while walking towards the first sound source which is between the dining tables, while in condition A the respondents only use the sound as a direction marker. In condition B, there is also the same case as in condition A, namely seat 1A which is the point where people with visual impairments often stop because they hit this chair, for more details, see the picture below:

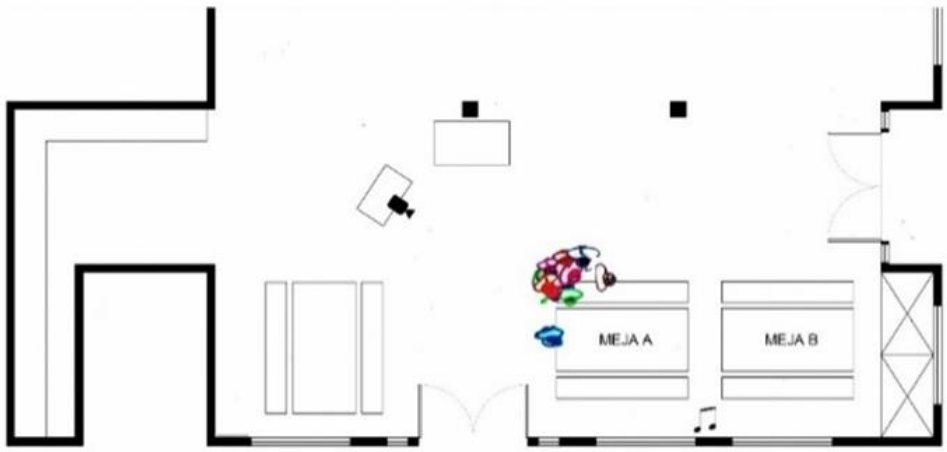

Figure 9. The first point visited by people with visual impairments in condition B
(Wasilah, 2019)

Same as condition A, after eating they go out one by one through the exit on the right. From the previous picture, it can be seen that the crowded point on the way to the exit is the point on the right side of the door, which is close to the dining area, here is a picture with only people:

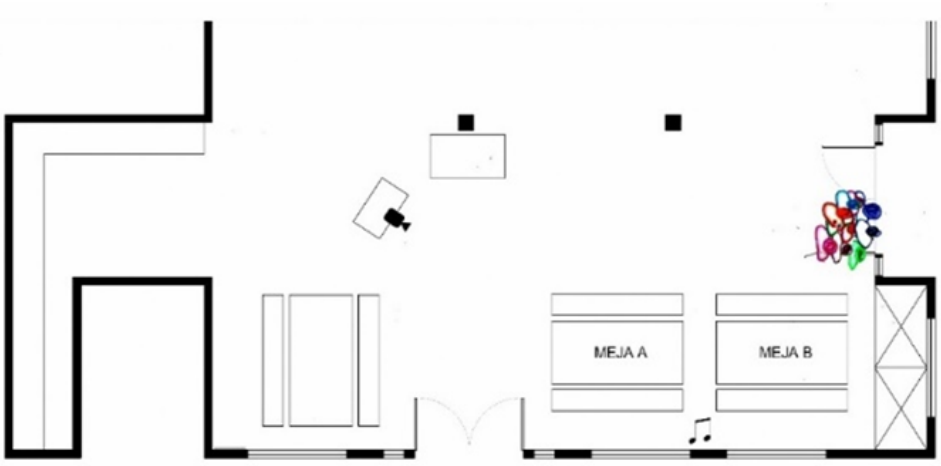

Figure 10. The last point visited by the blind person in condition B
(Wasilah, 2019)

After seeing the results above, it can be concluded that the most crowded point in condition B is seat 1A, and the corner of the exit which is on the right side of the door and close to the dining area.

Analysis of the Two Conditions

After obtaining data from the experiment, the two conditions were then analyzed using a diagram. From this diagram, it will be known how distance can affect the time for people with visual impairments to circulate, whether they use sound or not. In addition to distance, other considerations have also been obtained from the experimental data described previously. Diagram analysis is carried out for each circulation, namely the entrance – serving table, serving table – dining table, and dining table – exit.

Movement Chart of the Entrance – Table

The movement of people with visual impairments from the entrance to the serving table tends to be the same. In this circulation there are no disturbances for people with visual impairments. The challenge they face from this circulation is how to find directions from the door to the serving table.

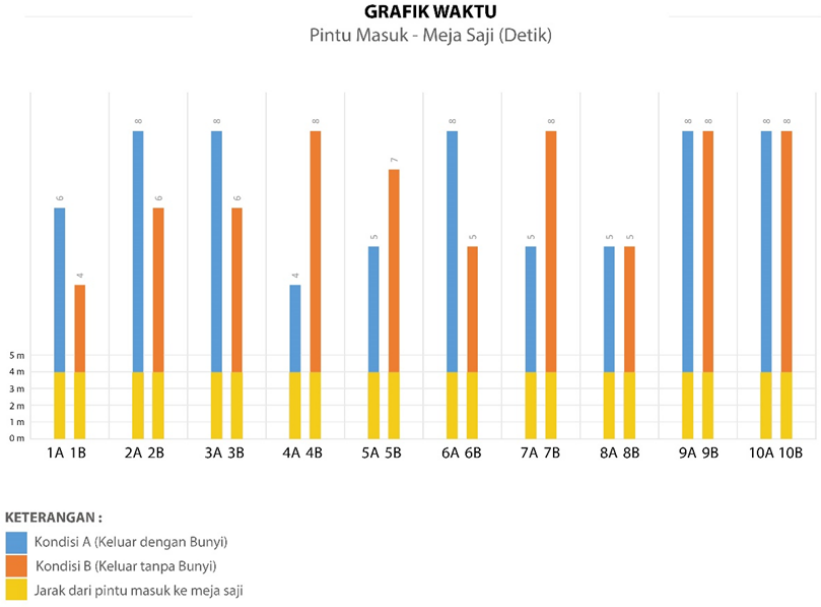

Figure 11. Movement Chart of the Entrance – Table
(Wasilah, 2019)

In this condition, the serving table is located about 4 meters in front of the entrance. There is no sound or furniture located along this path, so people with visual impairments tend to walk confidently towards the serving table.

Movement Chart of the Serving Table – Dining Table

The movement of people with visual impairments in the circulation of serving tables - dining tables is starting to look different. In this circulation, they face challenges in the form of a sound source in the form of a bell placed between tables 1 and 2, the layout of the dining table and chairs, as well as a narrow circulation area, which affects the distance and time they choose to eat chairs.

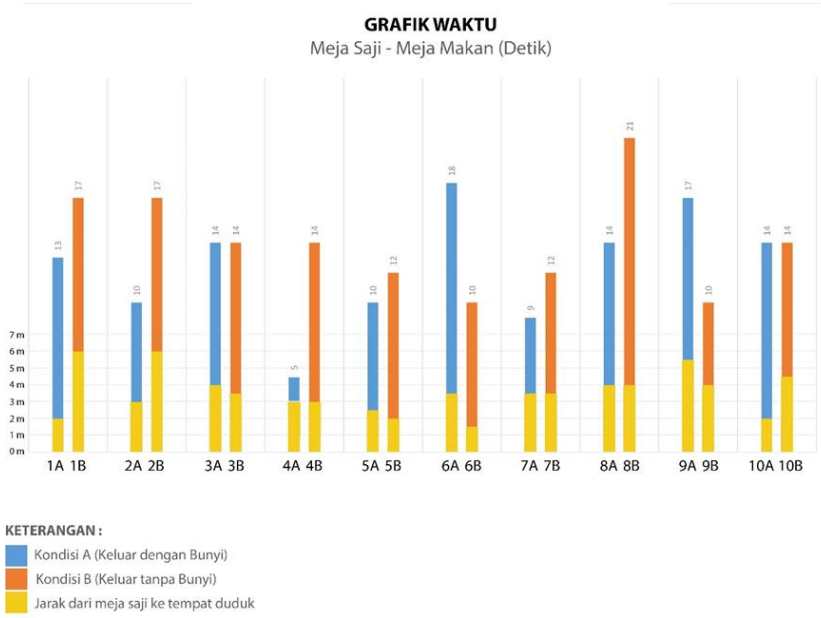

Figure 12. Movement Chart of the Serving Table – Dining Table
(Wasilah, 2019)

In accordance with the experimental layout described previously, there is a dining area that is closest and furthest from the serving table. However, this distance is not significant in influencing the speed of people with visual impairments in circulating. There are other factors such as obstructions from furniture in the middle of circulation, sound assistance from bells and friends, or experiences in circulation that affect their movement.

Movement Chart of Dining Table – Exit

The difference between condition A and condition B is very visible in this circulation. Because at the exit of condition A, sound is added, while at condition B it is not.

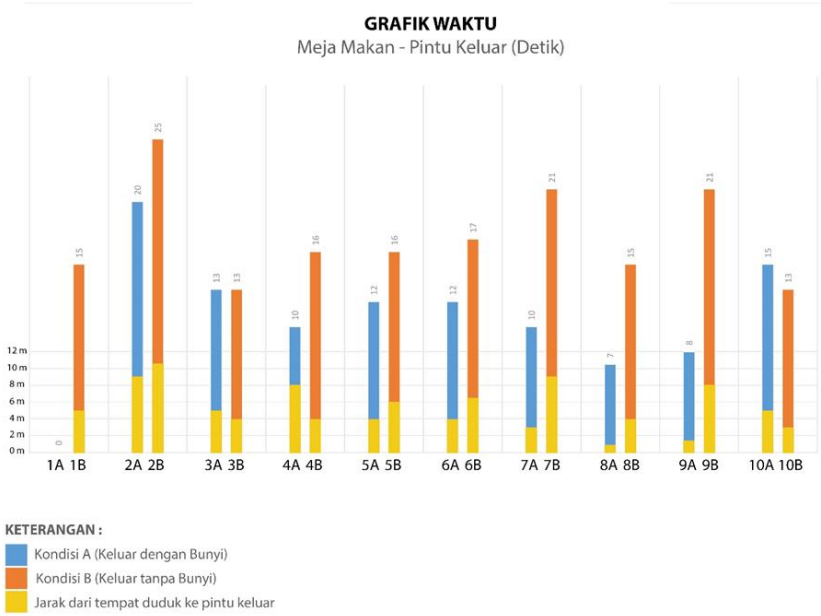

Figure 13. Movement Chart of the Dining Table – Exit
(Wasilah, 2019)

In the diagram above, it can be seen that people with visual impairments in condition B tend to take longer to walk from the dining table to the exit. One of the contributing factors is the absence of a sound source at the exit in condition B, which causes people with visual impairments in condition B to be more careful in circulating, especially in empty circulations that do not have a clue in the middle.

CONCLUSION

From the experiments that have been carried out, the following results were obtained:

1) In condition A which has a sound on the right side of the door, people with visual impairments tend to move towards the right side of the door and cross the empty circulation without hesitation. Meanwhile in condition B, which did not have a sound on the door, people with visual impairments tended to move towards the left side of the door closest to the furniture they used as a guide in walking.
2) For the condition of the dining room at PSBN Wyata Guna, the distance does not give too much difference in the time used by each person with a visual disability. There are several cases that have quite a large time difference, but this is followed by the layout of the furniture, the sound, and the experience of each individual.
3) The most visited area is the area closest to the serving table or entrance because this area is the easiest for people with visual impairments to access, so most of them will go to the nearest area first. The pattern carried out by each respondent tends to be the same, namely after taking food from the serving table, they will go directly to the nearest area.
4) Through the results of the analysis that has been stated in previous research, the design requirements are obtained to proceed to the layout design stage at PSBN Wyata Guna, namely:

The serving area is closest to the entrance, if it has more than 1 entrance, it must have the same orientation from each door.

1) The dining area is located on the side of the room and has sufficient circulation to enter and exit the dining table, if it is in the middle of the room, it must be accessible from all sides and not be an obstacle for people with visual impairments in moving around the dining room.
2) Circulation areas should have directions for people with visual impairments near important areas.

3) Sound sources are placed not close together, place sound sources in important areas and are far from each other, for example, placed at door A which is in the west and door B which is in the east.
4) If placing an interaction area, the area must be in a path that is often passed by many people.
5) Use a floor pattern that has different textures between areas, and also provide a floor pattern that is the main circulation in the dining room.

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