

# Behavior Settings of Classroom of Department of Architectural Engineering at Pontianak State Polytechnic in The New Normal

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**Abstract**—At this time, learning in the Department of Architectural Engineering at the Pontianak State Polytechnic is carried out in a hybrid manner (online and offline). Practical courses such as the Design Studio are carried out offline but are not effective considering that classroom settings such as furniture still use pre-pandemic settings; this still allows the transmission of the Covid-19 virus. This study aims to prepare for the new normal and prepare for the learning process, especially the classroom setting, both for the drawing studio and the theory room, following health protocols. The research method is the descriptive qualitative research method, a form of research aimed at describing or describing existing phenomena, both natural and engineered. The results obtained are recommendations for modeling space settings based on layout furniture where these results can be applied to New Normal conditions and in the future.

**Keywords**—*setting, layout, new-normal*

## I. INTRODUCTION

The emergence of the Covid-19 pandemic has changed people's lives, which is now referred to as the New Normal era. In this New Normal era, people must maintain a safe distance or call physical distancing to avoid spreading this virus. The emergence of a pandemic will form new behaviors to break the chain of disease spread and other destructive impacts. The regulation, which was born on the advice of various experts, especially in the health sector, is an effort to shape public behavior as an anticipation of the impact of the spread of the pandemic. WHO provides prerequisites related to the New-Normal policy. The essence of this New Normal policy is the implementation of strict health protocols, namely: wearing masks, maintaining physical distance, and washing hands frequently.

Opportunities to present solutions in design innovations based on health sciences and applied arts that can improve psychological health and provide spiritual space experiences in dealing with pandemics/epidemics [1]. Safdie [2] in his book "Balance Between Constraints," states that the presence of

architecture is not always identified with a magnificent, monumental, or luxurious form. Architecture is a responsive solution that can be present in all conditions. New patterns and behaviors, as well as lifestyles, should require change and adjustment. So, it is necessary to renew the need for space and facilities based on health standards.

It becomes fascinating to be appointed as this research topic to find out what kind of study room setting model is suitable to be applied in the new-normal era in the Department of Architectural Engineering Pontianak State Polytechnic. In the study room, one example is the drawing studio room. The students learn by making concepts, drawing two dimensions, drawing three-dimensional images, and making mockups. A long enough study room allows the transmission of the Covid-19 virus, primarily if it is not supported by learning facilities in the New Normal era. In designing the study room settings according to the health protocol, what must be considered is that the furniture setting and the movement of room users, especially students, significantly affect the room's activities. Judging from the phenomenon in the field, the setting of the existing study room is still not 100% applying the new-normal concept, so there is still a class area that is too crowded or too quiet. The main principle of the new normal is to stay active but maintain social distance and reduce physical contact with other people [3].

The architectural implications in handling the outbreak are not directly correlated, but the architectural reaction to the pandemic starts from the public sphere and macro systems in the form of government regulations and architectural engineering. Architecture provides a healing environment effect as an effort to reduce the physical and psychological pressure on residential dwellings as well as in public buildings such as hospitals, offices, and others which can be seen from conceptual aspects, programmatic aspects, and formal aspects [4].

In the face of an epidemic of cultural change, participate in being changed. In the pattern of life, the architectural reaction in dealing with the pandemic has also changed. The change

occurred in the scope of urban planning, private space, office/public space, hospital/public space [1]. On a micro-scale, private spaces will be created that meet physical and psychological needs, as well as biogenic balance. In the case of Covid-19, it has created a new norm order called the "New Normal," which will take place throughout 2020 [5].

From the rules above, the space reaction was created due to Covid-19. One example of a handwashing area available outside the building before entering the building is the change in the routine of studying on campus to studying at home so that it requires a space that can accommodate learning activities that are brought into the residence and others. Then came the term social distancing, a way to protect people who have not been infected so that the number of cases does not increase. Social distancing efforts will reduce the possibility of spreading the virus from sick people to healthy people [3]. The process of teaching and learning activities is a process that is quite important in the campus environment. In this teaching and learning process, arranging the lecture hall, including physical facilities and the physical environment, is necessary. The physical environment and facilities that are well designed to face the new normal will later provide a sense of security and comfort for the continuity of a good teaching and learning process [6]. The maximum capacity in the lecture hall is 25 students with a common area of 2 m<sup>2</sup>/student, as for the circulation of at least 60% to facilitate the students and lecturer's movement in the room. The layout and type of furniture influence the circulation of human movement in the study room. The furniture placement needs to be arranged in such a way as to produce circulation based on anthropometric data [7].

The seating arrangement pattern in the classroom/studio is divided into five types [8]:

- Rectangle pattern is a stacked pattern facing forward which forms a square pattern. The activity that occurs in this pattern is a little discussion.
- Semicircle pattern is a stacked pattern that forms an arch facing forward. This pattern is usually used for the auditorium.
- Horse-shoe pattern is a tiered pattern that goes around from several of the same patterns facing forward. This pattern is usually used in workshop rooms and lecture rooms.
- Conference pattern is a stacked pattern with a circular shape with a reference point in the middle. This pattern is suitable for use in meeting rooms or conference rooms.
- The pattern of round tables is composed of several similar patterns with several reference points. This pattern is usually used in studio rooms or rooms for internal activities.

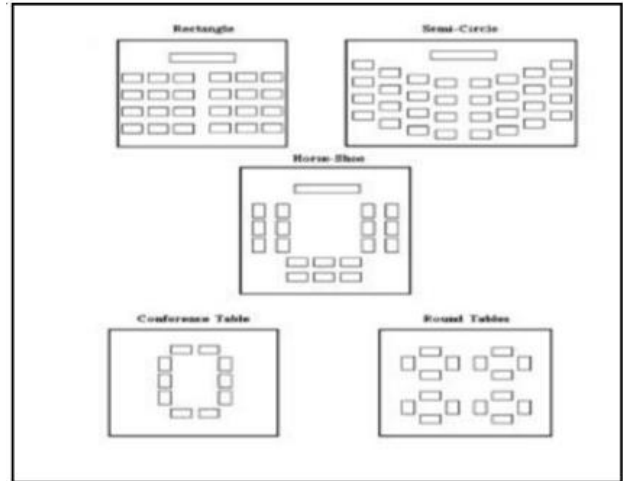


Fig. 1. Classroom/studio seating arrangements.

## II. METHODOLOGY

The method used is descriptive qualitative research. According to Bogdan and Taylor, as quoted by Lexy J. Moleong, qualitative research is a research procedure that produces descriptive data in the form of written or spoken words from people and observable behavior. A qualitative approach is research and understanding process based on a methodology that investigates a social phenomenon and human problem [9]. Moleong [10] explains that descriptive research is a form of research that describes or describes existing phenomena, both natural and engineered. The research location is in the Department of Architectural Engineering, Pontianak Polytechnic, by taking samples of study rooms, including manual drawing studio room, theory room, workshop room, Computer lab and multimedia room. The research stages begin with:

- Observations in the study room which includes furniture and supporting facilities.
- Then measure the space, the distance between the furniture and supporting facilities, and then compare it with the standard.
- Draw existing floor plans for the layout of the furniture/supporting facilities and their distances.
- Documenting the existing condition of the drawing studio through photographs.
- Making questionnaire to obtain data regarding the comfort of each student to the condition of the study room.

## III. RESULTS AND DISCUSSION

In creating architecture space, programming is needed in which there are several requirements and an activity space approach based on the use of the space or its suitability for the

site in question. The program will show the shapes and sizes of the space, who uses the space and for how long, and any special equipment or environmental controls [4].

The study room at the Department of Architectural Engineering on the 1st floor has three manual drawing studio laboratories, two multimedia rooms, and one workshop room. On the 2nd floor, there is one theory room and four computer laboratory rooms. The 2nd floor is connected by stairs which are in the back area of the building. There is an inner court right in front of the entrance of the Department.

On the 1st floor of the Department of Architecture, Pontianak State Polytechnic, it is used as a student study room, lecturer room, study program administration room, Head of Study Program and Department Room, Vernacular Laboratory, Construction Laboratory, Innovative Structure, and Building Physics, Manual Drawing Studio Laboratory, Library, service areas such as toilet and warehouse. The number of classrooms is six, consisting of 3 Manual Drawing Studios, one workshop room, and two multimedia rooms. The 2nd floor consists of 6 rooms, four computer laboratory rooms, one theory room, one operator room for Architecture and City Computer laboratory. There is a service area, namely the toilet, next to the computer studio lab 1 and 2.



Fig. 2. 1<sup>st</sup> floorplan. Source: constructed by authors, 2021.

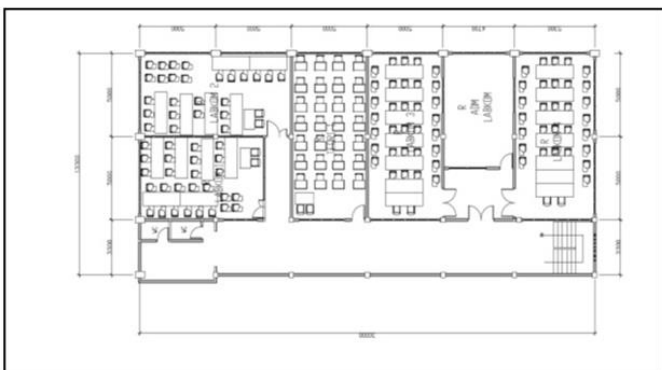












Fig. 3. 2<sup>nd</sup> floorplan. Source: constructed by authors, 2021.

Existing conditions can be seen in Table 1 below:

TABLE I. EXISTING CONDITION OF STUDY ROOM

First Floor		
		
<b>Studio 1</b>	<b>Studio 2</b>	<b>Studio 3</b>
This room is located on the 1st floor and opposite studio 2	This studio is opposite studio 1	Studio 3 is located at the back close to the stairs
		
<b>Workshop room</b>	<b>Multimedia room 1</b>	<b>Multimedia room 2</b>
This room is located parallel to studio room 3, close to the service room	This room is used for practical theory lectures	This room is used for practical theory lectures
Second Floor		
		
<b>Labkom 3</b>	<b>Labkom 4</b>	<b>Ruang Teori</b>
Located on the 2nd floor is used for lectures with computer media	Located on the 2nd floor is used for lectures with computer media	Located on the 2nd floor is used for theory lectures
		
<b>Labkom 1</b>	<b>Labkom 2</b>	
Located on the 2nd floor is used for lectures with computer media	Located on the 2nd floor is used for lectures with computer media	

The main principle of the new normal itself is to adapt to the pattern of life. Socially, it is a form of new normal or adaptation to activities and work, and of course, you must reduce physical contact with other people, avoid crowds, and work, a study from home [7]. In the Department of Architectural Engineering, the application of health protocols in adapting new-normal is carried out, among others, by wearing masks; before entering the Department, you are required to wash your hands using running water, measure body temperature, and sit in a class by keeping a distance. The class itself is divided into two sessions so that the safe distance is met. The cleaners regularly clean the room, and sterilization is carried out once a week, which is carried out on Saturdays because there are no lecture activities.

To prevent and reduce the risk of disease and virus transmission, apart from always wearing a mask, it is also necessary to maintain a 1.5 m between people. This arrangement is also helpful for the convenience of students in completing their work. However, considering the existing conditions, maintaining a distance is done by reducing the number of students to 50% and moving the rest to another room; this method is safe but not effective in the learning method because lectures are conducted in parallel and affect the time and number of teachers. Soedarsono [11] stated there are six layers for space to adapt: site, structure, skin, services, space plan, and stuff. New normal space adaptation refers to

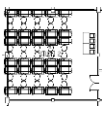


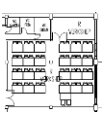
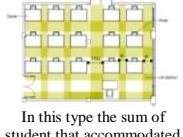
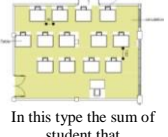

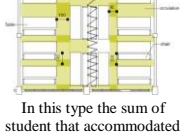
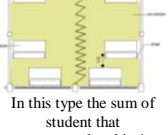
the Space plan, namely changing the interior layout of the room, walls, doors, and the like and stuff, namely changing the layout of furniture and or other objects that can be moved.

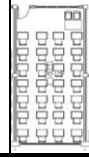
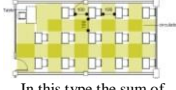
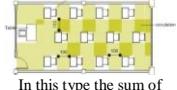

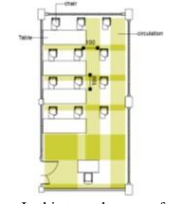

Three things are continually emphasized in the health protocol, namely having to wear a mask, maintaining emotional distance, frequently washing hands with soap with running water or with a hand sanitizer, and checking body temperature before entering public spaces. While in the room, the distance between the furniture must also be considered so that there is no virus transmission. In the Department of Architectural Engineering study room, 5 (five) samples of the room were taken, which represent the activities of theory, theory-practice, and practical lectures. These spaces include:

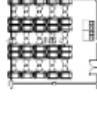
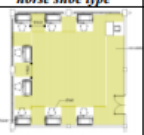
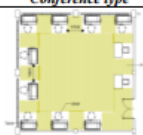


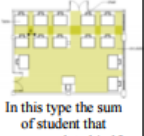
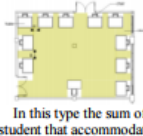
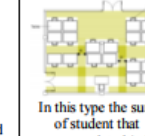

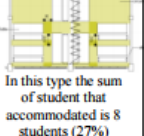
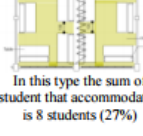
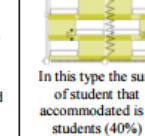
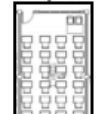
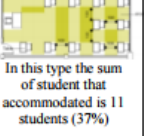
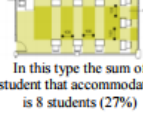
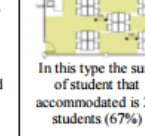
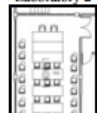
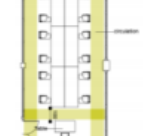
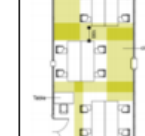
- Studio Room 1
- Workshop Room
- Room of Multimedia 1 and 2
- Theory room
- Computer Lab 2

The analysis focuses on looking at the room's comfort of movement and circulation in adapting to new normal conditions and health protocols. The spaces mentioned above are then configured with furniture layouts and layouts with the type of spatial arrangement of the rectangle, semi-circle type, horseshoe type, conference type, and round table type. The simulation of these spaces can be seen in the table below.

TABLE II. COMPARISON OF ROOM TYPES WITH STUDENT NUMBER RATIO

Rooms	Sum of Students	Room Type	
		Rectangle Type	Semi-circle Type
 Studio 1	30	 In this type the sum of student that accommodated is 16 students (53,33%)	 In this type the sum of student that accommodated is 13 students (43,33%)
 Workshop Class	30	 In this type the sum of student that accommodated is 15 students (50%)	 In this type the sum of student that accommodated is 13 students (43,33%)
 Multimedia 1 and 2	30	 In this type the sum of student that accommodated is 10 students (33,33%)	 In this type the sum of student that accommodated is 4 students (13,33%)

 Theory Room	30	 In this type the sum of student that accommodated is 14 students (47%)	 In this type the sum of student that accommodated is 12 students (40%)
 Computer Laboratory 2	30	 In this type the sum of student that accommodated are 12 students (40%)	 In this type the sum of student that accommodated is 8 students (27%)

Rooms	Room Type		
	horse shoe type	Conference type	round table type
 Studio 1	 In this type the sum of student that accommodated is 8 students (27%)	 In this type the sum of student that accommodated is 9 students (30%)	 In this type the sum of student that accommodated is 20 students (67%)
 Workshop Class	 In this type the sum of student that accommodated is 13 students (43,33%)	 In this type the sum of student that accommodated is 10 students (33,33%)	 In this type the sum of student that accommodated is 18 students (60%)
 Multimedia 1 and 2	 In this type the sum of student that accommodated is 8 students (27%)	 In this type the sum of student that accommodated is 8 students (27%)	 In this type the sum of student that accommodated is 6 students (40%)
 Theory Room	 In this type the sum of student that accommodated is 11 students (37%)	 In this type the sum of student that accommodated is 8 students (27%)	 In this type the sum of student that accommodated is 20 students (67%)
 Computer Laboratory 2	No simulation for this type	 In this type the sum of student that accommodated is 12 students (40%)	 In this type the sum of student that accommodated is 12 students (40%)

From the results of the analysis of table 2 above, for manual studio rooms with the application of new- normal adaptations



and health protocols, the round table type is the type that can accommodate more students than the other types, namely 67% while maintaining the health protocol. And safe distance. While the type that accommodates fewer students is the horseshoe type, as much as 27%.

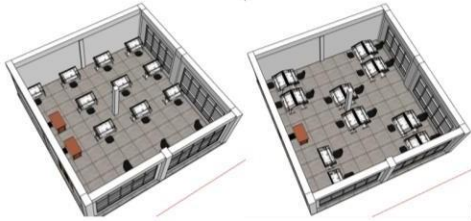


Fig. 4. Rectangle type (left) and round table type (right) in manual studio room Source: constructed by authors, 2021.

In the workshop room, the type that accommodates a more significant number of students and follows the new normal adaptation is the round table type, which is 60%, followed by the rectangle type, which is 50%. Both types are well suited to the capacity for learning to adapt to new habits. At the same time, the type that accommodates the least number of students in the workshop room is the conference type, which is 33.33%.

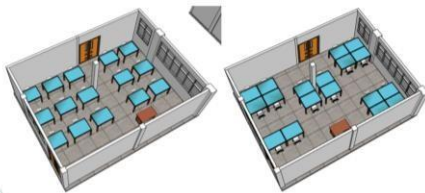


Fig. 5. Rectangle type (left) and round table type (right) in workshop room Source: constructed by authors, 2021.

The type suitable for adapting the new normal for multimedia rooms is the rectangle type, with the number of students as much as 33.33%. According to the new-normal learning recommendation, this amount is less than 50% due to the small area of the room with furniture that has a large area. The semi-circle type is the type that accommodates the least number of students in this room, which is 13.33%.

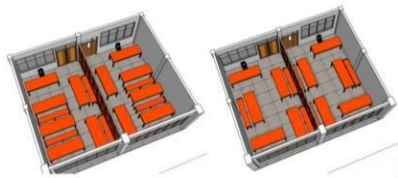


Fig. 6. Rectangle type (left) and round table type (right) in multimedia room 1 and 2. Source: constructed by authors, 2021.

In the theoretical space, the appropriate type is the round table type which can accommodate 67% of students, and the rectangle type, as much as 47%. The type that contains the least number of students in the conference type as much as 27%.

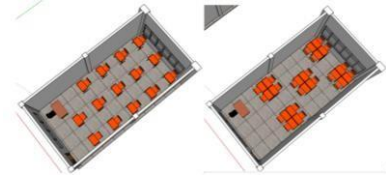


Fig. 7. Rectangle type (left) and round table type (right) in theoretical space Source: constructed by authors, 2021.

Lastly is the Computer Laboratory 2 room, the types that are suitable for adapting new habits are the rectangle type, conference type, and round table type as much as 40%. While the type that only accommodates a few students is the semi-circle type as much as 27%.

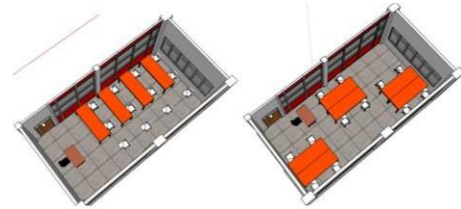


Fig. 8. Rectangle type (left) and round table type (right) in Computer Laboratory room 1. Source: constructed by authors, 2021.

Health and implement physical distancing under government regulations related to the learning system in the new-normal era. For the horseshoe type, the author cannot do the simulation because the room's width is narrow and the furniture is a combination of a table and a sitting chair, while the room's layout for this type requires a sufficient width of space. In table 2, the types in each study room in the Department of Architectural Engineering Pontianak State Polytechnic that can be applied in the new-normal era are rectangle type and round table type because the number of students accommodated is between 47-67% due to maximum room utilization, following the protocol. Meanwhile, of all types, the type that accommodates the least number of students in the conference type has a circulation area in the middle of the room, which is large enough to accommodate fewer students.

#### IV. CONCLUSION

Conditions in the study room of the Department of Architectural Engineering Pontianak State Polytechnic still require an adaptation process, especially in terms of health protocols and physical distancing according to government regulations regarding learning in the new-normal era. The room's furniture needs to be arranged at a certain distance not to gather some students in the class. Reducing the number or ratio of students in the class by 50% will not work effectively if the furniture arrangement is not adjusted to the recommended safe distance. Spatial planning following the new-normal era is influenced by:

- The size of the study room, the wider the study room, the easier it will be to arrange furniture under health

protocols and physical distancing and types of class layouts.

- The shape and size of the furniture, the simpler the shape, and the smaller the size of the furniture, the easier it will be to configure the seating.

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