Spatial Quality Concept Through Direction of View Accommodating Work for Home Activities in official Houses

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ABSTRACT

In the last 20 years, working from home (WFH) has become more common and even more popular due to the outbreak of the infectious disease COVID-19. This condition is a challenge for residences that are not designed for living and working, especially for houses that are not designed for work, such as official residences. Apart from that, there are restrictions on changing the physical structure of the building that residents must comply with. Knowing these conditions, it is necessary to pay attention to the quality of the building so that the building remains able to accommodate these activities. As a method to achieve research objectives, this research uses two strategies, namely qualitative as the dominant method and quantitative as the supporting method. Quantitative data as a grouping of resident data and as a basis for exploring data in the next stage, namely the qualitative stage. Qualitative data was analyzed using thematic analysis, to find themes related to quality spatial conditions to accommodate work activities at home. Based on the three existing unit types, the presence of other individuals constitutes unwanted visual content. In type 4, residents who work in the bedroom do not get the desired view because the distance between the units is too close. So that quality spatial conditions can be realized, it is necessary to pay attention to the following concepts: (1) Space presents the desired visual content (2) Uses furniture that is essential for work (3) Provides a personal touch (4) Windows with features that can regulate visual privacy.

Keywords: spatial quality; official house; WFH; visual concept; spatial conditions.

INTRODUCTION

Over the past two decades, work dynamics have evolved beyond traditional office settings, extending into telecommuting—a concept emphasizing worker flexibility through communication technology (Jack Niles, 1973). The prevalence of telecommuting has surged, particularly in response to the COVID-19 pandemic, compelling individuals to adopt work-from-home (WFH) practices for safety. Notably, not all housing types cater to residents' freedom, exemplified by official residences primarily designed for habitation rather than work activities. These residences, often subject to restrictions due to their non-private ownership, pose challenges, especially during a pandemic or increased home-based activities. According to Rudrum (2022), the transition to WFH, especially with limited prior experience, can be challenging due to shifts in human perception within a home environment.

Exnel and Pressel (2017) assert that the brain processes all sensory stimuli conveyed by space, influencing emotions, behaviors, and movements. Therefore, exploring official residences becomes imperative. Failure of official residence spaces to adequately support WFH activities may negatively impact employees' perceptions, as evidenced by Siqueira et al. (2020) and Kong et al. (2022). Challenges faced by employees, including difficulty in delineating work, private, and non-private areas, are particularly pronounced for those with young children. Rasheed et al.'s (2021) research delves into the impact of the work environment on comfort, health, and productivity. Building on prior studies, this research investigates how official residences' spatial arrangements facilitate WFH activities and explores residents' perceptions to enhance these spaces. Despite the constraints inherent in official residences, optimal comfort, health, and productivity levels remain achievable through strategic spatial considerations, considering factors like material age, texture, and color (Ellen et al., 2022).

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This study will evaluate official residences' spatial quality, considering their defined boundaries, and propose spatial concepts aligning with residents' needs. It underscores the importance of adapting official residences to support WFH trends, providing insights into enhancing spatial conditions and contributing to the future of remote work.

RESEARCH METHODS

Spatial Quality

Spatial qualities can be defined and differentiated based on the scale of housing, buildings and shapes depending on which point of view one wants to discuss. In this research, the concept of spatial quality is based on a building perspective, specifically residential buildings of the official residence type. Broadly speaking, quality is a component or feature that allows humans to obtain ease of life and can be defined as good or bad (Sekban, 2022). So, to determine good and bad, it is necessary to know what factors make quality good, especially the quality of human habitation. Space is part of a building that humans use for activities and living, so that the quality of space has a close relationship with humans. Seeing as there is a complex relationship between humans and the spatial qualities of buildings, ideas related to this cannot be studied adequately at one moment in time or in one culture (Rapoport, 1970). In order to understand spatial quality in buildings, Van der Voord (2005) argues that spatial quality is divided into 4 groups, namely: (1) functional quality, (2) aesthetic quality, (3) technical quality, and (4) economic quality. Then, according to Ching's (2008) findings, the quality of space can be determined based on three elements, namely the level of space closure, light, and direction of view. In the latest research conducted by Acre and Wyckmans (2014), it is known that spatial quality is an interaction between 4 determinants, namely: (1) view or view (2) spatial arrangement and spatiality (3) transition between public space and private space, and (4) the presence of density felt by humans.

View as Spatial Indicator

Human vision relies on both internal and external spatial cues. Internal spatial orientation, such as the focus within a room, contrasts with external views obtained through openings like doors and windows. These openings establish visual connections between the indoor space and its surroundings. Working consistently in an enclosed space without windows may lead to negative psychological effects, difficulty concentrating, and potential health issues. Research by Collins (1975) indicates that a window-to-wall ratio (WWR) between 30% and 60% contributes to visual comfort. However, a high WWR can impact visual privacy. Taehoon et al. (2019) note that a WWR of 30% - 60% enhances visual satisfaction compared to a WWR of 15%. Evaluating the content provided by windows is crucial for assessing the quality of the viewing direction and its impact on occupants' well-being (Lin, 2022).

Visual Attention as Spatial Indicator

Effective spatial design considers the function, purpose, and user interaction within a space. Furniture plays a pivotal role, influencing spatial functionality based on its layout and selection. Interior design elements, such as furniture arrangement, curtains, and finishes, serve both decorative and functional purposes, contributing to a visually stimulating environment. Color manipulation of room walls enhances furniture visibility, impacting occupants' perception (Sun, 2018).

Figure 1. Example Visual Attention: Aquarium as the Focus (Mangia, 2017)

Materials used in a space, particularly wood, can evoke natural characteristics, reducing stress levels (Wilson, 2006; Kellert, 2012). Uddin et al. (2022) reveal that furniture layout influences occupant presence and movement, guiding activities within specific areas. Considerations of room orientation, exemplified by the focal angle or arrangement towards key features, contribute to dynamic circulation patterns and visual comfort (Dodo, 2012).

Spatial Quality Perception

Interactions between humans and buildings shape perceptions within spatial environments. The communication between individuals and architectural elements, such as floors, walls, and ceilings, gives rise to distinct spatial experiences. Variations in spatial dimensions, such as openings in areas providing a sense of openness, influence human perception. The type of activity conducted within a space, whether residential or for worship, differentiates spatial perceptions. The diversity of activities within a residence creates varied spatial experiences. Viewing direction, as a key spatial quality indicator, has been shown to impact individuals' perceptions, especially during work-at-home activities. Awada et al.'s (2023) research reveals that space performance within a residence can influence stress levels during work. The appearance of the workspace, as discussed in this study, aligns with Kristiansen's (2009) findings that walls and wooden furniture contribute to a relaxed work atmosphere. Efficient furniture arrangement, emphasizing ease of organization in an office or work area, enhances comfort during indoor work (Samani, 2015).

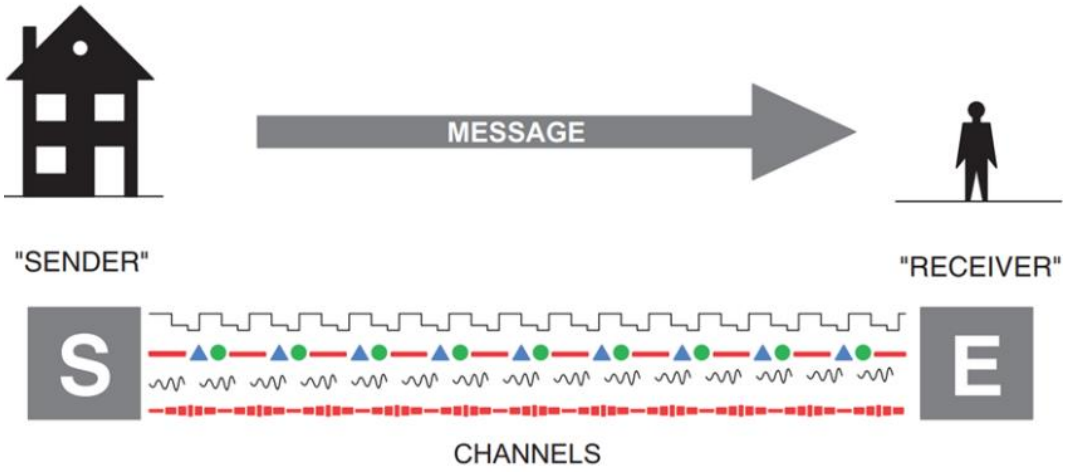

Figure 2. Process of human taking perception from their environment (Grutter, 2020)

Uncontrolled visual openness in the workspace may reduce concentration and elevate stress levels, negatively affecting productivity (Rashid, 2009). Haapakangas et al. (2018) highlight that overly open office spaces create distractions and stress, a concern also applicable to individuals working from home, especially when sharing workspace with family members or children (Galanti, 2021).

Indonesian Enterprises' Official Houses

From official definition, official houses can also be called agency houses or state-owned houses. In the Minister of State, State-Owned Enterprises, article 19, an official residence is a house belonging to a company (BUMN) whose role has been determined as a building that can be occupied by the company's employees, the employees are legal residents.

Qualitative Method Approach

The research embarks on the exploration of understanding through the adoption of a post-positivism paradigm and a phenomenological approach, as outlined in Architectural Research Methods (Groat and Wang, 2017). Employing direct observations, documentation collection, and data extraction from primary sources, the study centers on the uncertainty surrounding the spread of infectious diseases in official residences. Recognizing the distinct characteristics and limitations inherent in official residences-designed for habitation and subject to restrictions on altering physical structures-

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the research addresses varying housing capacities and facilities based on occupational classifications.

Research Location

East Java was chosen as the research location due to its dynamic industrial landscape, boasting 10 active industrial areas, as reported by the Indonesian Ministry of Industry (2016). Moreover, according to the Central Statistics Agency (2020), East Java exhibits a 13% increase in private companies from 2018 to 2020, outpacing West Java and Central Java at 10%. High economic development flow in an area often corresponds to residential development, as noted by Wawan (2021). Despite the absence of definitive data on official residences in each Indonesian province, Gresik City emerged as an ideal research location based on specific criteria. Building age and ownership status (State-owned official housing or BUMN) were identified as key factors for efficient data collection and analysis. The average age of official residence buildings in Gresik City is reported to be 65 years (Muniroh, 2015). The city's socio-demographic conditions are favorable, characterized by the presence of large companies and active industrial areas (Prasetyo, 2020). Notably, Semen Gresik's official housing aligns with the established criteria.

Figure 3. Research Location Scope

The current scenario reveals that not all units within each official residence category are occupied, with some units repurposed for various uses. Empty units serve as rental spaces, file warehouses, RT/RW warehouses, and children's interest studios. For this research, only building units actively occupied by employees with an active working status will be considered. This streamlined approach aims to facilitate a focused and efficient data collection and analysis process.

Qualitative Data Analysis

Qualitative data will be primarily collected through in-depth interviews with selected sources, namely residents of official residences from each work class. The interviews aim to delve into residents' perceptions of spatial quality when WFH and their understanding of an ideal spatial concept in official residences. Direct interviews, either in person or through agreed-upon communication media, will be conducted in the resource person's unit. Interactive interview tactics, employing floor plans and stationery, will be utilized if face-to-face interviews are not feasible. The researcher's role as an information gatherer will be clarified to sources, ensuring a transparent and collaborative interview process. Qualitative research is designed to delve into and elucidate

phenomena in-depth, guided by the analytical model proposed by Miles and Huberman (1992). The process involves distinct steps. Firstly, in the realm of data collection, in-depth interviews with selected sources are conducted, employing floor plans and tracing paper to capture detailed explanations.

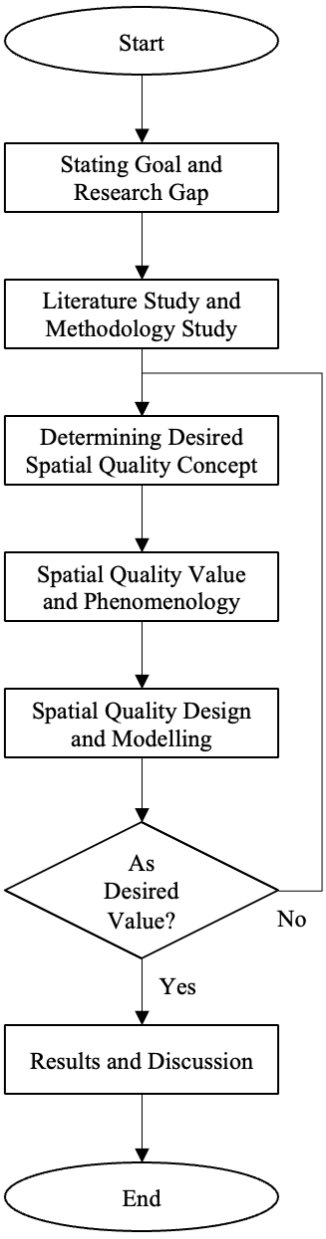

Figure 4. Research Flowchart

Subsequently, the data presentation takes the form of transcripts, facilitating comprehension during information processing. The data reduction process entails utilizing thematic analysis techniques to identify patterns or themes. This involves understanding transcript data, compiling codes, and determining themes based on the created codes. Lastly, drawing conclusions is an integral part of this analysis, where insights are derived from the scrutinized data, ensuring consistency and furnishing information to accomplish research objectives.

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RESULT AND DISCUSSION

There are three types of different house unit (Type 2, Type 3, and Type 4) and it would be representative to differentiate based on each type and each thematic analysis about how to and what condition that can make the spatial concept could accommodate WFH, as shown in the table below.

Table 1. Results of condition for accommodating WFH after qualitative research

No	Unit Type 2	Unit Type 3	Unit Type 4
1	There is visual content that is interesting or liked by residents	There is visual content that is interesting or liked by residents	There is visual content that is interesting or liked by residents
2	Have essential furniture for work	In rooms that are multifunctional (living room and bedroom), at least have essential furniture for working	In rooms that are multifunctional (living room, bedroom, dining room), at least have essential furniture for working
3	There is a personal touch in the workspace	There is a personal touch to the workspace, a minimalist space is also a reflection of the atmosphere that each occupant desires	There is a personal touch to the workspace, a minimalist space is also a reflection of the atmosphere that each occupant desires
4	Windows that provide views of the natural landscape	Windows that provide views of the natural landscape	Windows that provide views of the natural landscape
5	Space can visually protect occupants' work privacy	Space can visually protect occupants' work privacy	Space can visually protect occupants' work privacy
#	The success of spatial quality that reduces boredom is influenced by the presence of environmental attributes that are a source of stress or discomfort when working due to the activity/presence of other occupants.	The success of spatial quality that reduces boredom is influenced by the presence of environmental attributes that are a source of stress or discomfort when working, including the activity/presence of other residents and the ease with which outsiders can see residents' activities in the house.	The success of spatial quality that reduces boredom is influenced by the presence of environmental attributes that are a source of stress or discomfort when working, including the activity/presence of other residents, the ease of outsiders seeing the residents' activities in the house, a variety of furniture but its function is not for work.

In the previous discussion, it was found out what the condition of the spatial quality of the space used for WFH was by observation and assistance from questionnaire data. Based on this data, we found similarities in the concepts of the three types of units to achieve success in quality spatial conditions for working in official residences, namely:

a. The space for working should have a window that faces outside the building.
b. The windows in the room can provide natural views that cannot be found inside the house.
c. The space should not be filled with many items. Especially items that are not essential for work, knowing that there is limited land in the official residence.
d. The space should have a visual content arrangement of objects that are liked or have a personal touch.

Apart from these findings, it is known that there are other findings outside the limits of this research which can be used as corrections or research developments such as:

a. Spaces that are not multifunctional will be perceived as good, because they have minimal variety of furniture, and their function is focused on work. This is because at certain times residents cannot tolerate the presence of other individuals while doing WFH, such as when they are in a meeting or doing important work.
b. Spaces have features that can support certain habits. In the research, it was found that smoking was an activity that influenced the interviewees to determine their workspace. According to the source who is also a smoker, a room with lots of openings is the first consideration when choosing a workspace.

As can be shown in figure 5, in order for the viewing direction to provide quality spatial conditions for WFH in the home, it is necessary to pay attention to 3 factors, namely the factors that form the environment in the space, the characteristics of the openings of the space, and the elements that form the environment outside the space (Figure 4. 39). In this illustration, it is known that humans are subjects who are active in space. In order to obtain quality spatial conditions, the space needs to have openings that are oriented to the outside area of the building. This is done so that humans obtain diversity and continuity of viewing direction that is not available in space. To avoid uncontrolled variations in viewing directions in a room, variations in space filling elements need to be focused on things that are essential to support work activities. A room with a personal touch can provide its own comfort, this can be applied with objects that the room user likes, such as those related to their hobbies. According to the interviewee's opinion, this object is also able to give an interesting impression to the space. The presence of windows will affect the spatial quality of the room, so it is necessary to pay attention to how the arrangement of the external environment can provide quality views. Based on the results of observation analysis and interviews, it is known that plants play an important role in providing quality views. This will be better if the plants have a variety of variations such as a combination of trees, shrubs, ornamental plants and grass. Meanwhile, the existence of artificial characteristics is something that cannot be avoided, especially in residential environments, therefore it is necessary to consider the conditions of these artificial characteristics. It is best for artificial characteristics to receive good maintenance, for example, buildings that are not well maintained and worn out will give a gloomy and eerie impression.

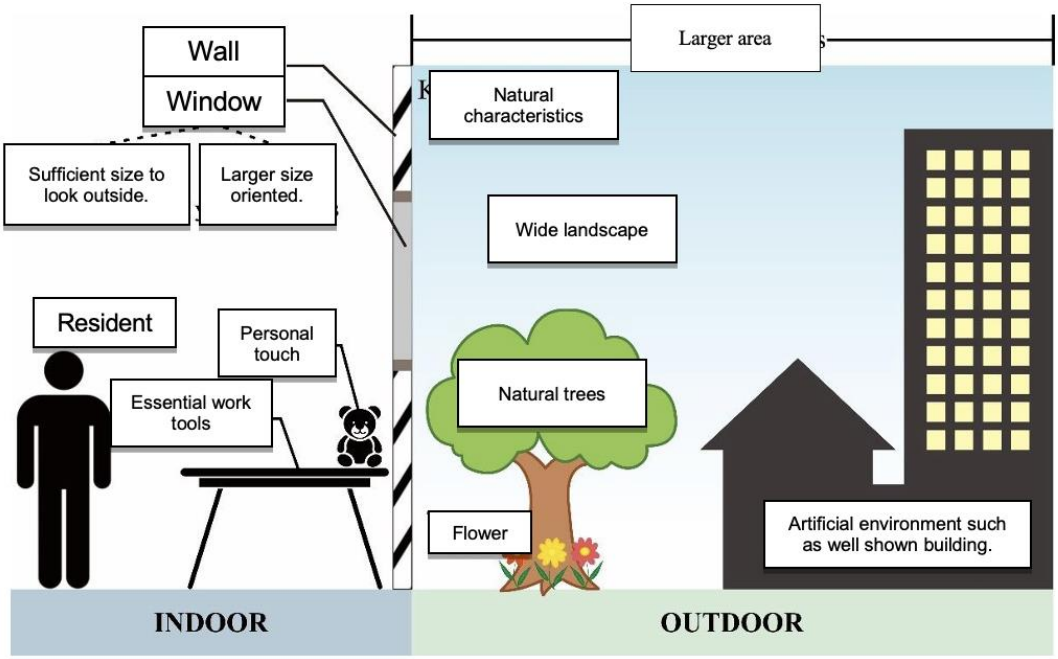

Figure 5. Visualization for good spatial quality concept for WFH

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CONCLUSION

Following an extensive process encompassing problem formulation, literature study, data collection, and analysis, the conclusions drawn are multifaceted. Firstly, regarding the existing spatial conditions in official residences, residents acknowledge the inseparability of spatial quality from their daily lives. However, certain conditions, such as the dominance of artificial characteristics in visual content and spaces originally not designed for work, contribute to inappropriate spatial quality. Secondly, residents' perceptions of spatial quality vary based on their official residence types. Type 2 residents find it easier to condition their desired workspaces, while those in Type 3 and Type 4 adapt to existing space limitations. Despite these differences, interviewees from all types share criteria for desired spatial quality, emphasizing spaces that accommodate work activities while alleviating work-related stress. Finally, the spatial concept for official residences to facilitate work-from-home (WFH) activities focuses on three pivotal factors: (A) factors shaping the indoor environment, influenced by room capacity; (B) the percentage of closure and design of openings to support continuous viewing direction; and (C) factors shaping the outdoor environment, impacting visual content in window views to provide stress-relieving scenes.

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