Architecture Student's Adaptation to Study Environmental Challenges: Covid-19 and New Norms

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Abstract. This study defines the atmosphere of architecture students studying at home using ergonomic space in the house as a learning space during the covid-19 pandemic situation. Since the Movement Control Order (MCO) in March 2020, all public universities in Malaysia have made it mandatory for their students to study from home (SFH). This means that different students have different study environments depending on their family economic background. Focussing on architecture students who involve a lot in designing works, they need a studio like setting i space to place drafting materials and tools, computer or laptop, and study and design furniture. This conducive studio setting is a key component in completing good architectural works within the given time frame. In response to SFH, this research aims to explore students' perceptions and experiences on their home ergonomic environments and what are their expectations for a better home study environment. The research applied quantitative method where sample respondents are among new Architecture degree students of UiTM Perak Branch. Questionnaires were emailed to all 400 potential respondents in the first semester, and 112 respondents have completed the form within a given period of time. In general, results have found that respondents have mixed feelings with regards to their perception on challenges SFH.

Keyword: Architecture Students, Study From Home, Ergonomics, Spaces and Furniture
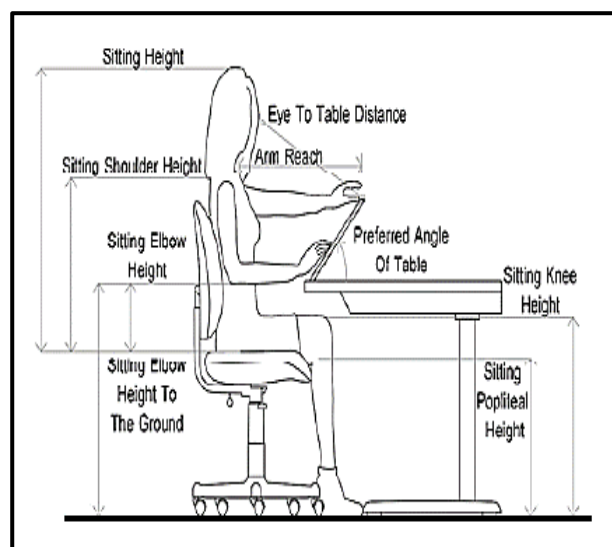
1. Introduction

Studies have shown that study from home (SFH) has affected students' performance especially for design-based students including architecture students due to an unconducive home environment. Previous study found that a working environment with appropriate ergonomics workspace plays an essential element to influence students' performance and improve the thinking process during academic sessions [1–3]. Ergonomic workspace in this research refers to the design and arrangement of tools and furniture where students feel comfortable and can easily reach them whenever they need. Students with a good ergonomics workspace are expected to be able to increase efficiency and reduce working time to produce design tasks [4]. Ergonomic workspace provides a conducive environment for students to develop their ideas, creativity and sense, and turn them into high quality design outcomes [5,6].

Apart from ergonomic workspace, architecture students also need to have ergonomic furniture such as tables and chairs for designing works. Since different students have different body sizes, it is advisable to use adjustable desks and chairs[7]. Students are able to adjust this furniture up to individual comfortless and avoid unnecessary body aches. High quality adjustable tables and chairs normally offer a better comfort level but it comes with price. Previous findings show that one of the significant factors to improve ergonomic workplace is by modifying or adjusting seating position with appropriate height and angle[8]. A study on the configuration dimensions with the best ergonomic efficiency in the workstation stated three varied parameters in the workstation: scope distance, scope height, and chair height [9,10].
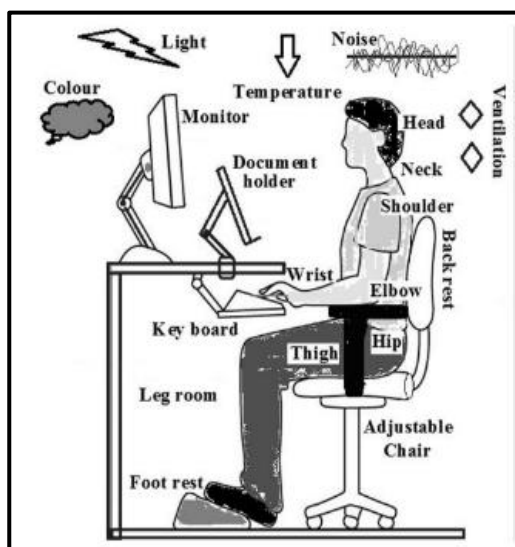
| **Figure 1.** The comfortable ergonomic[11] | **Figure 2.** Good Body Position During Using Adjustable [12] |

In general, SFH to a certain extent has caused great challenges particularly to the architectural students, where the quality of their design work is very much influenced by the ergonomic workspace of their home. The provision of ergonomic workspace at home for students whose parents can afford it is not an issue. However, parents with limited income and tight budget, it's a big challenge for them to provide ergonomic workspace, whereby they need to make do with their current home condition and utilise what is available at home. Obviously, students with various economic backgrounds are expected to experience different qualities of home ergonomic workspace. Hence this research aims to investigate the current scenario of the SFH environment and to provide recommendations for home workspace to improve the level of comfortless.

2.   Data Analysis and Findings

This study employed a mixed method approach where data was collected using questionnaire surveys and a case study on the home specification environment of one student. The following explain the details of surveys, analysis and findings.

2.1   Analysis and Findings from Questionnaire Survey

The population for sample respondents were from the 1st semester architecture students enrolled in UiTM Perak branch in March 2021. The total number of these new students is about 400. The questionnaire consists of seven open-ended questions concerning students' experience and perception in relation to their workspace and furniture during SFH. The variables included in the questionnaire are the number of family members, type of residence, space layout of residence, number of workdays in a week, home space utilised for workspace, comfortless of workspace, furniture preferences, and their preferred workspace. These questionnaires were distributed through email to all potential respondents using google form. Potential respondents were given five (5) working days to complete the survey form and by the end of the given period, this research managed to obtain 112 sample respondents. Data collected through open ended questionnaires were analysed and coded accordingly, and keyed into SPSS for analysis. This research applied descriptive analysis to answer the research aim.

Analysis has found that there were six (6) types of residence of respondents. Results show that 92% of respondents live in modern houses, namely bungalow, terrace, semi- detached, apartment and condominium and only 8% live in traditional houses (Figure 3). This shows that the majority of students have a considerably good standard of living. Size of respondents ranging from 1000 to 700 square feet and all respondents have three (3) bedrooms (Figure 4). Close to 54% of respondents have six and more household members (Figure 5). This shows that the majority of respondents have less space for studying where they have to share with other family members.
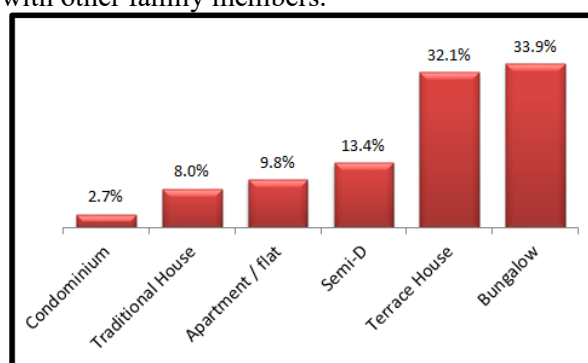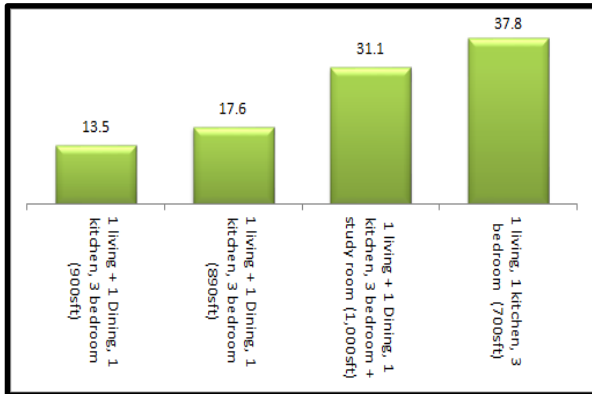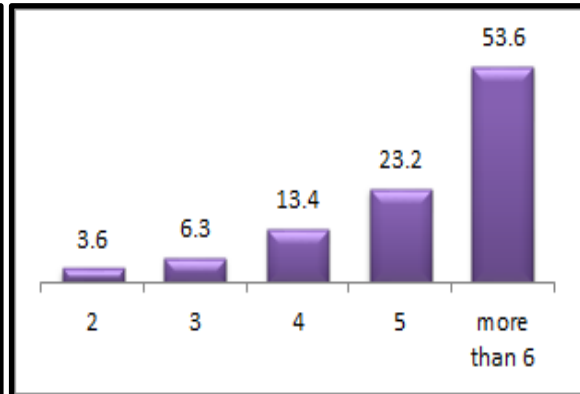

Figure 3. Type of Residence

**Figure 4.** Type of Space and Size of Residence

Figure 5. Number of Households

Respondents were also asked normally how many days they spend a week for SFH activities. The Number of days spent for SFH varies between respondents. Close to 50% of respondents spent 5 to 7 days a week and only 22.3% spent 2 days and below (Figure 6). 48% of respondents who spent 2 days and below SFH had the biggest household size (Figure 7). This shows that to a certain extent the number of households might influence motivation to study.
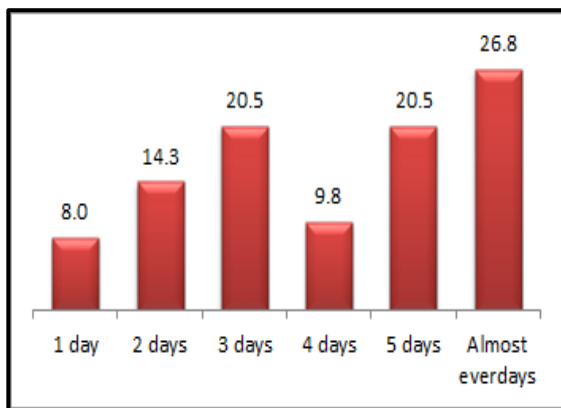

Figure 6. Number of Workdays per Week
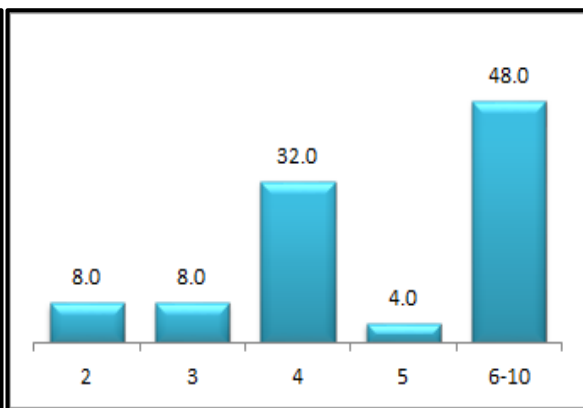
Figure 7. Respondents Who Spend 2 Days and below for SFH and Household Size

When studying at home, students are free to choose their favourite available space for SFH activity. This research found that 63.4% of respondents preferred to conduct SFH in the bedroom while 2.7% in the kitchen and 0.9% had no specific space (Figure 8). Bedrooms become the most preferred because they offer better privacy compared to other places. In terms of comfortless, respondents have mixed feelings (Figure 9). 39.3% of respondents feel comfortable SFH, 38.4% moderate and 22.3% uncomfortable.
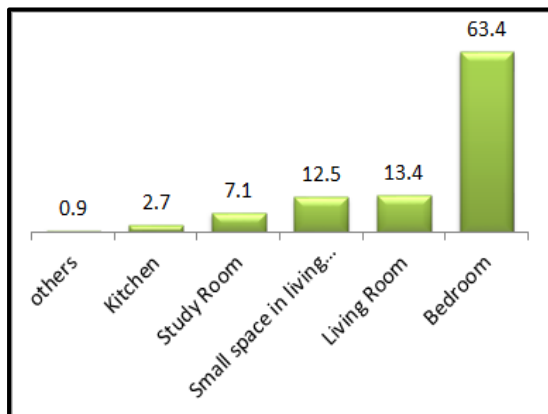
**Figure 8.** Space Normally Utilised during SFH
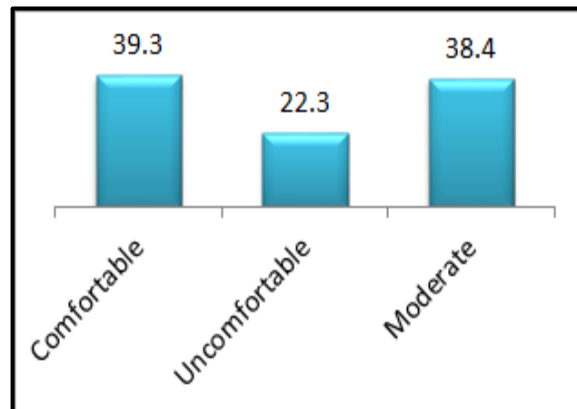
Figure 9. Perception on the Comfortless During SFH

With regards to the importance of elements during SFH, respondents highlighted three (3) elements namely privacy (70.6%), table (22.3%), chair (3.6%) and 3.6% of respondents are not sure (Figure 10). This clearly indicates that the majority of respondents would like to have privacy in order for them to stay focused in completing their design work. They need allocated space to place a drafting table, computer table, chair and drawing tools with reasonable privacy level. Privacy is one of the important elements to achieve ergonomics at home.

In addition, respondents were also asked if they were given an opportunity to upgrade their workspace for SFH, which space they preferred most (Figure 11). Majority of respondents hoped to upgrade their bedroom (40.2%) and study room (30.4%). The upgraded workspace would be enough to place all necessary furniture, tools and materials for design works.
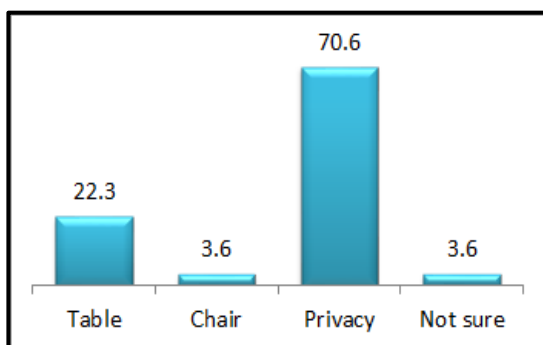

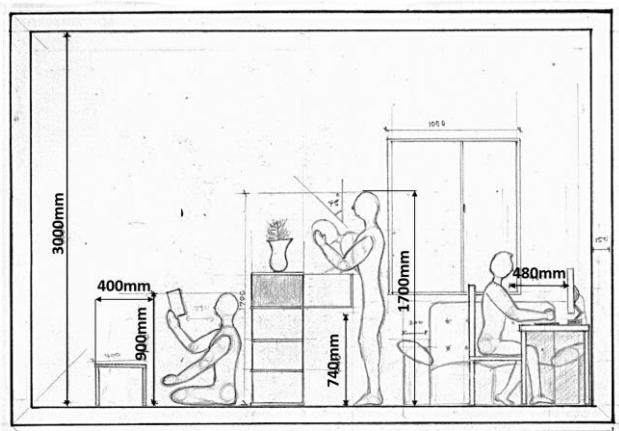**Figure 10.** Important Elements that Make Respondent Comfortable during SFH
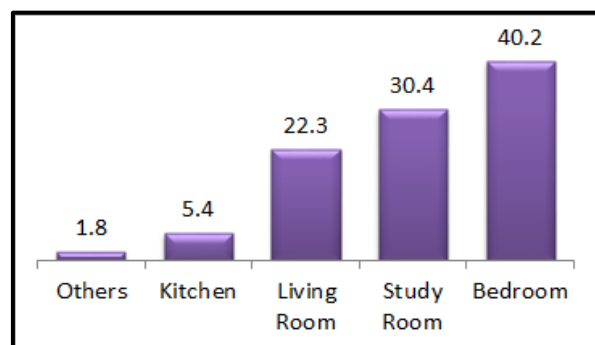
Figure 11. Preferred Space to Upgrade for Workspace During SFH

2.2   Analysis and Findings from a Case Study

In addition to questionnaire surveys, this research also uses case study on one of the respondents who volunteered, identified as Mr X. This is to further understand the closed-up layout and detailed furniture in the workspace of a sample respondent. This case study explains how architecture student normally play around with the available space at home for SFH. Mr X lives in a two-storey semi-detached house located in Kajang, Selangor. There are four family members in the house, his parents and a younger brother. Mr X and his brother are both involved in SFH, and their parents have allocated space for each of them to study. Mr X is given a 4.5m x 3m (approx. 15' x 10') room with a well-ventilated window, enough daylight, and an air-conditioning unit for workspace. The respondent volunteered to provide the sketches with measurement of his workspace as shown in Figures 10 and Figure 11.
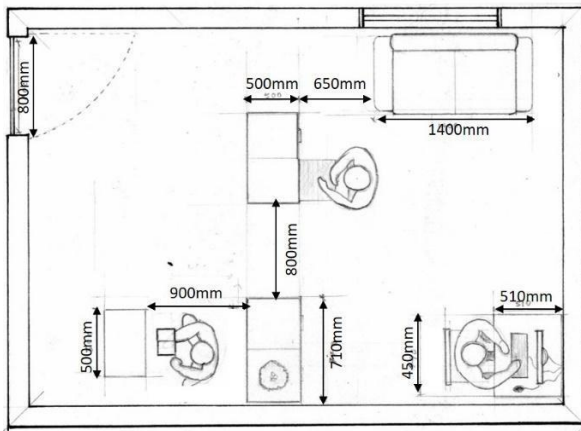
Figure 12. Workspace Floor Plan of Mr X   **Figure 13.** Workspace Section Pan of Mr X

Workspace of Mr X contains two study tables, a Japanese table and a study table, a chair, two bookshelves, and a two-seater sofa (Figure 10). Considering room size and furniture arrangement, this room is able to be utilised by three people at a time (Figure 11). The arrangement of furniture is seen as appropriate for design works and provides a conducive and comfortable environment. According to Mr X, the arrangement is done by himself and he enjoys and feels good working and studying in his room during the SFH session. Good furniture arrangement offers ergonomic space where fits individual body size and posture to moving around within the room space to reach tools and materials for design work. Obviously, the comfort level of the workspace is highly related to the arrangement of the furniture in the room[13].

Apart from furniture arrangement, size and design of each furniture is equally important to help increase conduciveness of the workspace. With regards to Mr X's workspace, this furniture is seen as acceptable for common use of reading and writing. However, for an architecture student who involves long hours of designing work, appropriate furniture will definitely help students to feel more comfortable. Working on a design project requires consistent body movement such as standing and sitting while doing the drawing and product modelling. Thus, adjustable furniture, especially chairs and tables with suitable size will help to fit individual body posture and hence provide comfortless [14].

3.   Recommendation and Conclusion

Overall, the architecture students have a different atmosphere studying at home based on ergonomic learning space during the covid-19 pandemic situation. Some students are lucky enough to have all necessary furniture, tools and materials placed in an allocated workspace. However, there are some students with financial constraints who have no choice but to settle with whatever is available in the house. This of course will create inconsistency or a gap of home environment among all students that will reflect in the quality of their design output. This gap is usually solved where the university provides a specific architecture studio with all necessary furniture and equipment. In order to minimise students' home workspace gap between students, it is recommended that lecturers provide simple tips to especially new architecture students. For instance, one good tip is regarding the arrangement of the home furniture in order to obtain maximum ergonomic workspace with no or minimum budget. It will focus on positioning of existing furniture and equipment within the available spaces [4].

According to the household living at home, respondents facing the situation are crowded with family members, and the respondents find it challenging to find space for making models or drawing. For *Spaces Commonly Used for Study from Home (SFH),* respondents are more comfortable doing their architecture work in the bedroom, which is more private and easier without interrupting other people. The other aspect is furniture at home which the respondents need personal space and adjustable for them to make drawing and ergonomics at home. In conclusion, this study would help ensure ergonomic space for students in doing their drawings and models during Study From Home (SFH). Further research with different methods, target groups, and larger samples is recommended to achieve more vital findings. In addition, if students have a very low budget, advise them to spend on a good chair with adjustable specifications because research found that chairs significantly contribute to level of comfortless [7]. Adjustable chairs can be set to an individual's desired body posture and hence gain maximum comfort.

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