UNIVERSITI TEKNOLOGI MARA
Cawangan Perak
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e-Proceeding

v-GOGREEN2020

29 - 30 SEPT

VIRTUAL GO-GREEN: CONFERENCE & PUBLICATION

"SUSTAINABLE ENVIRONMENT, RESILIENCE AND SOCIAL WELL-BEING"

Organiser :
Research, Industrial Linkages, Community & Alumni Network (PJIM&A)

Co-organiser :
Faculty of Architecture, Planning and Surveying (FSPU) & Centre for Post Graduate Studies (CGS)

Publication Date : 22nd February 2021

Virtual Go-Green Conference and Publication 2020

UNIVERSITI TEKNOLOGI MARA, PERAK BRANCH
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e ISBN 978-967-2920-06-9

ASSOCIATION BETWEEN BIOPHILIC HOME OFFICE SETTING AND ACADEMICIANS' PERCEIVED PERFORMANCE BY USING SMARTPLS

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Abstract

Prior research has documented that the natural elements or biophilia and the office setting have positive effects towards personnel performance and well-being. Yet, less emphasis has been given to the personnel who are working at home due to the sudden shift from working at office to working from home because of Covid-19 pandemic. In view of that, this study aims to examine the association between biophilic home office setting and academicians' perceived performance. 260 questionnaire responses from academicians who work from home due to Covid-19 were analyzed by using Statistical Package for the Social Sciences (SPSS) version 25.0 and SMARTPLS; a partial least squares-structural equation (PLS-SEM) modeling software for hypothesis testing. The results of the hypothesis testing show that biophilic elements in a home office setting showed perceived enhancement of the academician's performance. Subsequently, the findings will contribute in the development of a comprehensive biophilic design elements model for home office setting**.**

Keywords: *biophilic design; home office setting; perceived performance; SmartPLS*

1.0 INTRODUCTION

As the Covid-19 spread, institutions shut down physical campuses and began to work from home to contain the diffusion of Covid-19 virus. The sudden shift has caused academicians to work from home, which means they need to set up a home office workplace or setting for course delivery. It is worth to note that a working environment can influence the performance of an organization (Garg & Talwar, 2017). Working as an academician is often related to long working hours and heavy workloads (Facey et al., 2015). Workers or personnel who spend most of their time doing their work in a poor environment tend to feel stressed, a high level of anxiety and depression which lead to low engagement at work, which later may reduce performance (Ong & Azizi, 2019; Smith et al., 2015).

Recent studies indicate that biophilic office settings have positive effects on human health and performance which has reinforced 1984 Edward O. Wilson's Biophilia hypothesis that humans possess an innate tendency to seek connections with nature. For instance, research on biophilic design submits that the built environment can become restorative through the natural elements implementation (Miller, 2019).

Although few studies have measured the effects of biophilic in working environment and its effects on health and working performance, post Covid-19 spread, the associations between biophilia in a home office setting due to the sudden shift from working at office to working from home and performance of personnel is yet to be established. In order to contribute to the literature on biophilic on a home office setting, this study aims to examine the association between biophilic home office settings and perceived performance of academicians.

2.0 LITERATURE REVIEW

Research on biophilic design submits that the built environment can become restorative through the natural elements implementation (Miller, 2019). Furthermore, biophilia design looks at the relationships between nature, human biology and the design of the built environment for humans to experience expedite restoration in stress and clarity of thoughts or attention (Terrapin Bright Green, Browning, Ryan, & Clancy, 2014).

2.1 Biophilic Settings

Human exposure to biophilic settings can ensue through three experiences of nature: direct experience with nature, indirect experience with nature and experience of space and place. Direct experience is being physically present in the natural setting where contact with plants and animals occur (Kellert, 2008). Besides, Kellert and Calabrese (2015) elucidate that the direct experience of nature as the real contact with environmental features in the built environment. Examples of direct experience of nature are plants, water, air, natural light and landscapes.

Indirect contact with nature would be considered physical contact with representations of plants and animals or an artificial form of nature (Miller, 2019). The term indirect experience of nature refers to contact with nature through pictures including images of artwork, natural materials such as woolen fabrics and ornamentation inspired by forms and shapes occurring in nature (Garg & Talwar, 2017).

The third experience is the space and place, which refers to the living organisms and environments depicted through images or metaphorical expressions of nature (Gillis & Gatersleben, 2015). Furthermore, experience of space and place may be defined as spatial features characteristic of the natural environment that contributes to human health and well-being. Examples of experience of space and place are organized complexity, prospect and refuge, mobility and wayfinding as addressed by Green, et al. (2014).

2.2 Perceived Performance

Castelle (2017) defines perceived performance as a self assessed form that is based on the individual's perceptions, opinions and experiences. In lieu to that, the prevalent indicator to obtain the individual's performance results is by using questionnaires and interviews (Dias, 2015).

2.3 Association between Biophilic Settings and Perceived Performance

The elements of nature or biophilia in the work environment could affect occupant's well-being and enhance their performance (Browning & Cooper, 2015; Smith & Pitt, 2009). As Dias (2015) observed, occupant's felt pleased and enthused with the presence of indoor plants in their working environment. Furthermore, there is a positive relationship between the presence of natural elements and productivity as Browning and Cooper (2015) pointed out. Equally significant, a study by Smith and Pitt (2009) confirmed that the employees who were working in an office with the presence of indoor plants felt more productive, healthier and reduced their stress level.

2.4 Conceptual Framework and Research Hypothesis

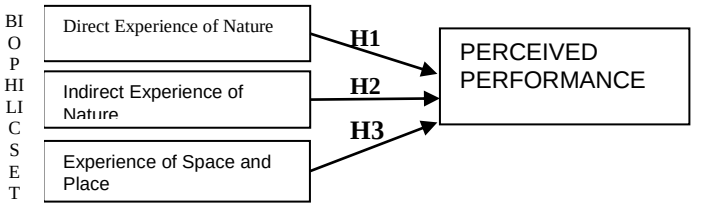

Figure 1: Conceptual framework

Figure 1 displays the conceptual framework and research hypothesis of the association between biophilic settings and perceived performance.

Main hypothesis: There is a significant association between biophilic settings and academician perceived performance.

H1: There is a significant association between direct experience of nature and academicians' perceived performance.

H2: There is a significant association between indirect experience of nature and academicians' perceived performance.

H3: There is a significant association between experience of space and place and academicians' perceived performance.

3.0 RESEARCH METHODOLOGY

The cross-sectional method was used in this study to allow the researchers to use literature review on biophilic strategies and occupants' perceived performance, pilot study, and questionnaire as key procedures in data collection (Sekaran et al., 2014). The data was collected through a questionnaire survey and were analyzed by using Statistical Package for the Social Sciences (SPSS) version 25.0 and hypothesis testing was managed by SMARTPLS. Out of the total questionnaires distributed, only 67.11 per cent (100) were fully answered by the respondents. The sample size fulfilled the requirement of data analysis using statistical inference (Sekaran et al., 2014; Creswell 2012). The questionnaire comprised three main sections: first, section A consists of questions on demographic information of respondents such as gender, age, work experience and others. Section B focuses on the biophilic strategies in UiTM Perak office building. The respondent was asked to rate the five-point agreement likert-scale which are 1 (Strongly Disagree), 2 (Disagree), 3 (Neutral), 4 (Agree) and 5 (Strongly Agree). The objective of this section is to determine the biophilic strategies in UiTM Perak office building. While section C, focuses on the relationship between biophilic strategies and occupants' perceived performance. The objective of this section is to analyze the relationship between biophilic strategies and occupants' perceived performance. Furthermore, the SmartPLS method was used to evaluate the validity and reliability of the study questionnaire, subsequently, testing the study hypotheses (Hair, 2017).

4.0 RESULTS AND DISCUSSION

The results of demography analysis show that the majority of respondents were female 54.2 percent (141) and between 18 and 20 years old (99%). The age of the respondents is categorized into 3 categories which are 21 to 35 years old (48.1%), 36 to 50 years old (37.7%) and more than 50 years old (14.2%). Next, most of the respondents have less than 5 years (37.7%) of working experience. The analysis of the results also show that basically, most of the respondents (71.9%) have live plants at their workspace. Last but not least, the majority of the respondents (89.2%) get natural light at their workspace while the remaining respondents (10.8%) do not get any natural light.

Table 1: Results of item loading value and construct item reliability

No	Variables	No. of Items	Item Loading (≥ 0.70)	Composite Reliability (≥ 0.80)
1	Direct experience of nature	5	0.706 - 0.894	0.920
2	Indirect experience of nature	5	0.790 - 0.898	0.931
3	Experience of space and place	6	0.850 - 0.911	0.955
4	Occupants' perceived performance	3	0.780 - 0.877	0.868

Based on the measurement model analysis, Table 1 shows the item loading value for each construct is greater than 0.7, in which the value confirms that the items for each construct achieve high reliability (Fornell & Larcker, 1981). Subsequently, each construct has a composite reliability value greater than 0.80, which means that the measurement scale has a high internal consistency (Henseler 2015).

Table 2: Construct item value and discriminant validity test

No	Variables	AVE (≥ 0.5)	1	2	3
1	Direct experience of nature	0.698			
2	Indirect experience of nature	0.730	0.537		
3	Experience of space and place	0.778	0.606	0.593	
4	Occupants' perceived performance	0.687	0.760	0.764	0.774

Table 2 shows that the Average Variance Extracted (AVE) for each construct is between 0.698 and 0.778, in which it exceeds the required critical value of 0.5 (Hair et al. 2017). This indicates that the study constructs fulfil the criteria of convergent validity (Henseler et al. 2015). On the other hand, the Heterotrait-monotrait (HTMT) value for each construct is less than the required critical value of 0.85 (Hair et al 2017). This means that the study constructs have fulfilled the criteria of discriminant validity set that is each construct in the study framework differs from one another (Henseler et al. 2015).

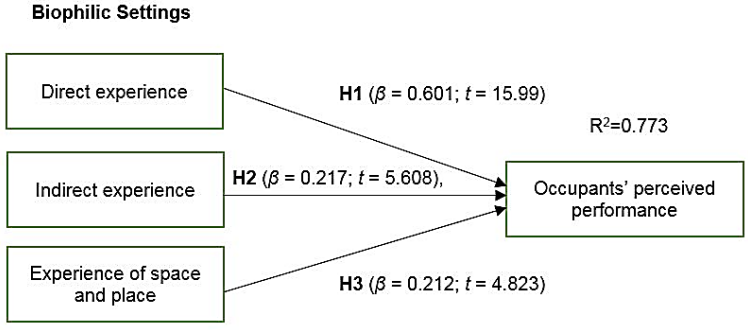

Figure 2: Results of path analysis

Source: Authors' Research (2020)

Results from Figure 2 also explain the inclusion of independent variables (Biophilic Settings) of the path model in SmartPLS contributes 77.3 per cent to changes in the dependent variable (Occupants' perceived performance). Meanwhile the other 22.7 percent of it is influenced by external factors. These values can be considered satisfactory (Cohen, 1977). Based on the structural model analysis, the results of hypothesis testing using path model analysis in SmartPLS yielded several key findings: first, direct experience (β = 0.601; t = 15.99) has a strong significant relationship with occupants' perceived performance. Secondly, Indirect experience (β = 0.217; t = 5.608), experience of space and place (β = 0.212; t = 4.823) also have a significant relationship with occupants' perceived performance. Therefore, all hypotheses have been supported in this study. This study used a significant level of 1.96 (two-tailed) to determine the direction among variables as described in the study hypotheses (Henseler et al. 2015). Besides, further to the above hypothesis testing, a test of accuracy of the estimate (predictive relevance) using Stone-Geisser, the Q2 test had been carried out as specified: q2 = Q2 included-Q2 excluded / 1-Q2 included = 0.331 (Hair et al., 2012); and it was found that the Q2 (0.516) is above the standard, which is greater than zero (Henseler et al., 2009). Therefore, these findings generally support the expected accuracy SmartPLS route model used in this study.

5.0 CONCLUSIONS

Overall, this study proves that significant biophilic strategies, which are shown by direct experience of nature, indirect experience of nature and experience of space and place, clearly indicate that these strategies will give positive impacts to the academicians' perceived performance. However, direct experience of nature acted as the most dominant to the implementation. Therefore, studies show that there is a strong relationship between biophilic strategies and academicians' perceived performance. The area of this research study is led by the literature review and the results are based on the data analysis of the questionnaire. As it is not a conclusive study, therefore, there are some points that can be taken to improve the outcome of the survey. Any further studies could be conducted on strategies of biophilic on other groups of profession about their perception towards biophilic home office setting and academicians' perceived performance.

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Sekian, terima kasih.

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Saya yang menjalankan amanah,

SITI BASRIYAH SHAIK BAHARUDIN
Timbalan Ketua Pustakawan

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Setuju.

27.1.2023

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