

A COMPARATIVE STUDY ON THE IMPACTS OF OPEN PLAN AND CLOSED OFFICE LAYOUT TOWARDS EMPLOYEES' PERCEIVED PRODUCTIVITY

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Abstract: *The open plan layout has dominated workspaces in various sectors of the professional world, with advocates claiming that it promotes an interactive and collaborative work environment. Despite the many known benefits of the layout, recent works have also proven that the open plan office layout can make it difficult for executives to encourage collaborative interaction and productivity amongst their employees. The objective of this study is to identify the impact of open and closed office layouts based on privacy, concentration levels, social interaction, health and wealth being within the workplace towards the employees' perceived productivity. As a case study, an office in Thompson Hospital, Damansara, Selangor was chosen as the layout of the office represent the typical standard open and enclosed office. Through a self-administered questionnaire, the findings and data were collected and analysed. The data showed that respondents from open plan offices still scored the least level of satisfaction and positive perception towards the constructs relating to their productivity within their work environment especially in terms of overall health and wellbeing due to the office layout. Interestingly this survey also points out that employees located in closed private offices also show high levels of dissatisfaction in other aspects such as social interaction within the work environment. The findings may be used to provide an insight of office employees' perception of the relationship between office layout and the overall impacts towards their perceived work productivity.*

Keywords: *Open Plan Offices, Workplace Efficiency, enclosed office*

Introduction

Studies in social psychology have demonstrated that architecture and physical layout can substantially influence variables such as patterns of communication and social interaction (Oldham & Brass, 1979). For more than a century, the open-plan model has dominated workspaces with advocates claiming that it encourages a vibrant collaborative and interactive workspace. There are two basic approaches that might be used to understand how open plan offices influence employee reactions to work which is the social relations approach and the social technical approach.

The social relations approach claims that the absence of interior walls and partitions in open-plan offices encourages the development of social interaction and relationships among employees, which, in turn, positively influence employee motivation and satisfaction (Bach, 1965). Meanwhile, sociotechnical theorists suggest that the absence of physical boundaries in a work space creates opportunities and experiences for employees that differ substantially from those they might encounter if working in an area bounded by walls and/or partitions.

The open-plan layout has dominated workspace in various sectors of the professional world, with advocates claiming that it promotes an interactive and collaborative work environment. Despite the many known benefits of the layout, recent works have also proven that the open plan office layout can make it difficult for executives to encourage collaborative interaction and productivity amongst their employees (Bernstein, 2018; Gaskell, 2018; Scalco, 2017). As people desire more privacy, open space workplaces tend to limit their privacy as they are transparent to anyone in the area and sometimes make them uncomfortable. Haughton (2018) also agreed that open space layout bounds an individual personal space which will lead to decline in face to face interaction and collaboration. With open planned office, employees felt their privacy was invaded as their actions or conversations can be heard by people around them. Factors such as lack of privacy, over hearing colleague conversation and thermal conditions are among the responses given by the employees (Tanabe, Nishihara & Haneda, 2015; Been, 2014). The findings showed that the employees expressed their dissatisfaction working in the environment they are in as the factors mentioned above acted as a barrier for them to perform their task.

Open plan work environments tend to limit employees' ability to *concentrate* on their tasks (Sander, 2018). When employees have a hard time focussing due to distraction, cognitive and emotional resources are drained. Moreover, rather than encouraging higher quality face to face interactions, the open plan layout has shown to set off a natural behavioural response to *socially retreat* from work colleagues and interact instead over email and instant message (Stillman, 2018). In general, open plan layouts showed considerably higher dissatisfaction rates than enclosed office layouts with more than half of the occupants expressing dissatisfaction with the condition of sound privacy.

A closed office, on the contrary, is a type of working area where employees have their own individual working areas distinctly divided either by using walls, cubicles or panels. As an employee has a separate cubicle where to work from, many would suggest that concentration levels are maximised, and in turn boosting efficiency. While this is true to a certain extent, it is evident that for some employees being restricted to a cubicle for several hours a day may feel rather oppressive (Naish, 2018). Furthermore, closed offices provide a higher level of privacy which plays a crucial role in the decision making process as well as bringing a feeling of security. Other benefits include having a clearer sense of hierarchy and heightened efficiency due to minimal distractions. On the other hand, the downsides include higher cost, low supervision and limited opportunities for social interaction and collaboration amongst staffs. In conjunction to that, unlike open offices, closed offices can help minimise distraction allowing employees to work better and produce quality results. Closed offices are better used for companies with jobs that require concentration and quiet working areas such as law firms, accounting agencies and other businesses in the financial sector (Reddy, 2019).

In a closed layout, the hierarchical order is very clear as usually the quality of the office reflects the position of the employee within the office. This can be an incentive for new employees to

work harder for a higher position in the company while introducing healthy competition in the office. In addition, the closed layout provides health safety for employees as it reduces the likelihood in the spreading of disease. Likewise, it also encourages a healthy working environment as it minimizes the amount of interaction or gossip among employees.

Consequently, this would decrease the amount of distractions that is known to be a common trigger of stress within the workspace as well as decrease the likelihood of social conflict

Literature Review

The open plan and enclosed office layout

An **open-plan office** is generally defined by the absence of interior partitions and rooms, which in conventional 'multi cellular' offices, define private work spaces. An open-plan office space is an office floor plan that eliminates most private offices and meeting spaces. There may be a private conference room or two to facilitate private meetings, but most day-to-day business operates with everyone working in the same room. This has become a modern design to facilitate innovation and creativity. Many co-working spaces have also emerged boasting the ability to work and network at the same time (Leonard, 2018). Physical characteristics of an open plan office may also include baffled ceilings and the use of thick carpeting to provide acoustical control. A study done by Loughton (2017) stressed that office layout do influence employees' satisfaction. Perceived noise, perceived health, perceived psychological discomfort and perceived psychological wellbeing were found to be the factors that contribute towards perceived employee satisfaction at work. The more of these factors exist in the work environment, the more the employees' performance decreased. This is due to the fact that these factors are the interferences which may cause disturbances for them to perform their work. Tanabe, Haneda and Nishihara (2015) undergone an investigation on the impact of thermal condition and office layout and proved that thermal condition can influence the workplace productivity. The more comfortable they are with the temperature in the office, the better they can perform their work.

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is evident that for some employees being restricted to a cubicle for several hours a day may feel rather oppressive (Naish, 2018). Furthermore, closed offices provide a higher level of privacy which plays a crucial role in the decision making process as well as bringing a feeling of security. Other benefits include having a clearer sense of hierarchy and heightened efficiency due to minimal distractions. On the other hand, the downsides include higher cost, low supervision and limited opportunities for social interaction and collaboration amongst staffs.

On the other hand, the enclosed office layout is also known to have its own set of disadvantages that may pose a threat to overall productivity. For one, low supervision of work as supervisors would have to move from one office to another to constantly be updated with what each employee is doing at each point of time. This involves a wastage of time and thus more time would be required to complete a task (Reddy, 2019). Due to the higher level of privacy, employees may also be able to take advantage of separate space and lack of supervision by

using the time at work to go on social media or engage in other negative behaviour. This has a direct and profound relation to productivity of employee.

Factors affecting employees' productivity in an open-plan and enclosed office layout.

In their study, Bernstein and Turban (2018) concluded a *lack of privacy and personal space* as key factors potentially causing the significant decline in social interaction and overall effectiveness in the open-plan office studies. According to their findings, people need to feel comfortable and require boundaries to make sense of their environment. A lack of privacy can cause employees to have a harder time in concentrating and focussing on their tasks due to a lack of visual and sound privacy which may inhibit their cognitive performance, increase stress and decrease their wish to engage in social interaction at work.

In addition, several studies have found that noise that usually open offices are accompanied with is a persistent distraction for workers. Distraction caused by noise can drain employees' time and overall job performance especially when they perceive the environment to be out of their control (Lee & Jeon, 2019). It can also cause heightened levels of stress, which in turn can cause employees to withdraw from social interaction and subsequently effecting collaboration, the efficiency of the flow of information and co-worker feedback which plays a vital part of a company's productivity and output. The researchers stressed that people working in a closed office tend to satisfy with the privacy, productivity support and concentration when performing their tasks. Lee and Jeon (2019) and Sakellaris, Saraga, Mandin, Roda, Fosati, Szigati and Bluyyen (2016) proved that users for open space offices decrease their satisfaction due to noise disturbance, occupants' psychophysiological reactions and communication at workplace. Thus, they also confirmed that the longer the noise interruption, the less satisfied the employees are. This action itself may *inhibit social interaction and collaboration* while effecting the overall productivity and flow of information within the office (Kwon & Remoy, 2019; Scalco, 2017).

In conjunction to that, in relation to health, a study conducted by Oommen, Knowles and Zhao (2008) found that working in open plan environments causes high levels of stress, conflict and high blood pressure. This also supports the cause of higher rates of absenteeism.

Another study done by Shafaghat, Keyvanfar, Lamit, Mousavi and Majid (2018) also confirmed that open office can boost social interaction, cooperation, feedback and knowledge sharing communication. However, their study also suggest that flexible office should also be made available and can be used when it is needed. Moreover, in contrast to the need for privacy in an office environment, there is also the need for interaction to exchange knowledge and information (Haynes, 2008). This may be quite limited within closed office environment. Communication among staff members is not as effective due to the proximity of workers from one another. In fact, friendship opportunities within the work environment would also be reduced. Likewise, the flow of information within the workplace would also be decelerated.

In addition, due to the physical barriers in an enclosed office environment, supervision can be quite difficult (Reddy, 2019). This plays a crucial role in the productivity of a workplace as the lack of supervision can lead to employees' indolence and engage in negative behaviour such as browsing the internet for purposes unrelated to work causing a direct impact to employees' *job performance*. Thus, it is evident that through this literature review that the five constructs that best measures perceived productivity in a work environment are, 'privacy and concentration

levels’, ‘job performance’, ‘social interaction within the work environment’, ‘overall health and wellbeing’ and ‘environmental satisfaction’ formed the framework for this research.

Methodology

Since this is a case study scenario, an office located at Thompson Hospital, Kota Damansara, 47810 Petaling Jaya, Selangor was selected for this research. As a case study, a research facility in Thompson Hospital, Damansara, Selangor was chosen as it comprised of open plan offices, enclosed shared offices as well as enclosed private offices providing substantial support to conduct this comparative research. A census was used where all the 60 employees working on the first floor of the hospital were selected and agreed to participate for this research. Once the permission to collect the data at Thompson Hospital was granted, the researcher distributed the questionnaires personally. As the purpose of this research is to acquire the employees’ perception towards the impacts of their office layout towards their productivity, a questionnaire was adapted based on five constructs: privacy and concentration levels, job performance, social interaction within the work environment, overall health and wellbeing and environmental satisfaction. Two weeks were given to the respondents to answer the questionnaire and the researcher managed to collect all the questionnaires by the end of the week. All 60 questionnaires were returned and considered usable which reflects the 100% response rate.

Demographic Data

The majority of the respondents involved in this research was female (40%) obtaining tertiary education (55%). The detail of the demographic is shown on Table 1.

Table 1: Demographic of the Respondents

Office Layout		Open Plan		Enclosed Shared		Enclosed Private		Total
Variables		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Gender	Male	7	35	4	20	9	45	20
	Female	13	65	16	80	11	55	40
Level of education	SPM/	2	10%	3	15%	0	0%	5
	Diploma	7	35%	8	40%	10	50%	25
	Degree	7	35%	6	30%	6	30%	19
	Master	2	10%	3	15%	1	5%	6
	PhD	2	10%	0	0%	3	15%	5
Work Category	Managerial	3	15%	7	35%	3	15%	13
	Technical	1	5%	1	5%	1	5%	3
	Admin	10	50%	9	45%	6	30%	25
	Others	6	30%	3	15%	10	50%	19

Descriptive Analysis

To determine the level of agreement from the respondents on the constructs as indicated in the questionnaire, a 5-point Likert Scale is used in the questionnaire. Table 2 illustrates the overall mean scores of employees' perceived productivity. The table displays a clear comparison and overview of responses on the perception of employees across each of the constructs. Namely, privacy and concentration levels, job performance, social interaction within the work environment, overall health and wellbeing as well as environmental satisfaction. It shows that members of the open office have the least level of satisfaction and overall perception towards their productivity within the workspace scoring a total mean of 3.15. Employees from enclosed shared offices scored a total mean of 3.23 while employees from the enclosed private offices were most satisfied and had a slightly more positive perception towards the productivity within their work environment scoring 3.27. Overall, the score indicates that on average, employees across the three office layout types were generally neutral towards the perception of their work environment on their productivity as there are no significant differences between the mean scores. Members within the *open office* showed the least level of satisfaction towards privacy and concentration levels scoring a total mean of 2.66. The result is to be expected as open plan layouts are widely acknowledged to be more disruptive due to uncontrollable noise and loss of privacy (Kim, 2006).

The other area of main concern for employees within *open offices* refers to the construct regarding overall health and wellbeing. The mean score of 2.92 indicates that on average, employees show a more negative perception towards how their office layout affects their health and wellbeing. This suggests that open offices may give a direct negative impact on employees' health and mental wellbeing. This observation can be supported as a study conducted by Dr. Vinesh Oomen (2008), found that working in open plan environments causes high levels of stress, conflict and high blood pressure. In addition, a general sense of overstimulation can also be linked to heightened stress (Sander, 2018). Thus, affecting the mental health of employees within an open office.

Next, employees within *enclosed shared offices* show the highest level of dissatisfaction in terms of job performance and environmental satisfaction scoring a total mean of 3.21 and 3.33 respectively. In essence, in terms of job performance, enclosed shared office employees scored the lowest in questions regarding ease of supervision, speed of task completion and ease in flow of information. This suggests that employees within enclosed shared offices believe that certain qualities within their office layout may be a constraint towards their work productivity.

Moreover, in terms of environmental factors within the office, employees within *enclosed shared offices* showed the least level of satisfaction in questions regarding workplace efficiency, workplace comfort, control over physical conditions within the office as well as satisfaction in terms of proximity within other employees. The finding suggests that environmental factors within an office plays a big role in employees perceived productivity. By the same token, it is also important to note that there is no indication or data supporting the efficiency of the environmental factors within the office. On the contrary, employees within *enclosed private offices* showed the least level of satisfaction and positive perception towards social interaction within the work environment scoring a total mean of 3.22. This suggests that there is limited interaction between employees of this office layout type. This may be due to the communication gap amongst employees that are in enclosed office environments as they work in separate spaces and are further in proximity between one another (Reddy, 2019). Nevertheless, the overall score indicates that on average, employees in the sample are generally

uncertain or neutral the impacts of their office layout towards their productivity. In accordance to that statement, the design of the office space within a hospital is designed to accommodate specific tasks required to be performed at its most efficient while prioritizing the welfare of patients. Both the open plan and enclosed office model have equally its own sets of advantages and disadvantages towards the overall productivity of the employees Table 2 displays the result.

Table 2: The Overall Mean Score of Employees' Perceived Productivity

Construct	Average mean		
	Open Plan	Enclosed Shared	Enclosed Private
Privacy and concentration levels	2.66	2.99	2.84
Job performance	3.45	3.21	3.55
Social interaction within the work environment	3.35	3.33	3.22
Overall health and wellbeing	2.92	3.26	3.24
Environmental satisfaction	3.39	3.33	3.49
Total mean score	3.15	3.23	3.27

Conclusion

This paper highlights a few important findings that need to be addressed. Based on the findings in chapter 4, it is clear that the overall score indicates that on average, employees in the sample are generally uncertain or neutral on the impacts of their office layout towards their perceived productivity measured through the five constructs that have been created which is in terms of privacy and concentration levels, job performance, social interaction within the work environment, overall health and wellbeing as well as environmental satisfaction.

Notably, a significant difference in results were shown in the perception of overall health and wellbeing in which members occupying the *open plan office* are considered to have expressed the highest level of dissatisfaction. This information can be justified as the open plan model is known to be linked with causing high levels of stress, conflict and high blood pressure resulting from overstimulation (Oomen, 2017).

Furthermore, respondents from *open plan offices* show the highest level of dissatisfaction in terms of privacy and concentration levels. This supports the general idea that open plan offices are likely to cause this due to an increase in exposure to stimuli from the absence of physical boundaries that may cause cognitive performance to decline and reduce the ability to focus (Miller, 2018). Thirdly, respondents of *enclosed private offices* seem to show the highest level of dissatisfaction in terms of social interaction within the work environment. This can be due to the limited opportunity of interacting as a result of the presence of physical barriers.

Moreover, respondents of enclosed shared offices display the highest level of dissatisfaction in terms of job performance and environmental satisfaction. This finding and the correlation between them suggests that environmental factors play a big role in job performance and employees overall perceived productivity within their workspace.

Although there are issues pertaining to privacy, job performance, overall health and environmental satisfaction, among others, it is important to take various factors such as job functions into account before coming to a direct conclusion.

To conclude the findings, the results on average, indicates that employees across the 3 floor layouts are generally unsure or uncertain regarding the impacts of their office layout towards their perceived productivity. This can be due to the nature of the work itself as it is categorized under the healthcare sector. Hospitals and facilities within it are generally designed to accommodate the variations of tasks required to be performed while maximizing efficiency for staffs and the welfare of patients. One pertinent question emerging from the findings above is whether office layout is attributable to the employees' perceived productivity. In essence, the various types of office layouts can be effective if it is managed appropriately by a management of a business.

Recommendations

In maximizing the effectiveness in productivity for each office layout, it is important to strike a balance between social interaction and privacy to give employees the power to choose how much of either one they require and when. Rather than a 'one size fits all approach' as is traditional in open plan and enclosed private office design. Work environments should allocate multiple ranges of varieties in terms of enclosure, ergonomics and other environmental factors such as lighting and thermal conditions that encourages productivity within the work environment. Employees received a lot of benefits from interactive workspaces, but it is also a vital necessity to have areas in which they can go to in order to process interactions, hold private meetings, conduct work that requires strict concentration or is time sensitive, or otherwise satisfy their own personal work style. In addition, it is important to not disregard the effects of other environmental factors within the office. No matter the configuration of your workspace, employees' health and efficiency can be improved by ensuring the flow of quality air, using natural lighting and providing access to green spaces.

There were several limitations to this study. First, the number of case studies and respondents were small and may not be representative of the broader population. Furthermore, the study only focusses on offices under the healthcare sector which might not have substantial support to generalize the data collected. Nevertheless, the interesting findings highlight the imperative need to address the role of other environmental factors and physical conditions of a work environment to employees overall perceived productivity. This may include access to daylight, air quality, thermal and lighting conditions and control over the physical conditions within a workplace. On the contrary, not much information has been gathered on the possible influences that the physical characteristics of a work organization may have on the behavioural patterns on employees and overall organizational health and productivity.

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