An Overview of the Influence of Physical Office Environments towards Employees

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Abstract

Office employees spend a lot of their time inside a building, where the physical environments influence their well-being and directly influence their work performance and productivity. In the workplace, it is often assumed that employees who are more satisfied with the physical environment are more likely to produce better work outcomes. Temperature, air quality, lighting and noise conditions in the office affect the work concentration and productivity. Numerous studies have consistently demonstrated that characteristics of the physical office environment can have a significant effect on behaviour, perceptions and productivity of employees. Most of the previous researchers in their studies are more focused on a single factor that could give an effect on employee’s performance at work. However, no study was done to examine the relationships between the whole factors of physical office environment and employees’ performance. Therefore this paper presents a literature review of several environmental factors which directly or indirectly affect employees work performance. Several factors of environments such as the effects of workplace design, indoor temperature, colour, noise and also interior plants towards employees well-being and performance have been discussed.

Keywords: satisfaction; office environments

1. Introduction

Office employees spend most of their time inside the buildings in which they work in, therefore the physical environment of an office or workplace is important to develop a good and healthy working environment.
environment. According to Denyer (1969), an office is a place where the clerical operations are conducted [1]. While S.P Arora (1980), states that ‘office can be described as any place where information on paper and information is documented converges, preserved and used for current operations of the businesses [2]. Besides, Audrey Kaplan & Stan Aronoff (1996), stated that "there is a common understanding of an office building as a workplace is held that the information and knowledge processing activities of an organization, including filing, planning, designing, supervising, analyzing, deciding and communicating. Office buildings developed from the need to plan, co-ordinate and administer these activities"[3]

Research has consistently demonstrated that characteristics of the office environment can have a significant effect on behaviour, perceptions, and productivity of workers [4]. Dole and Schroeder (2001), stated that in the workplace, it is often assumed that employees who are more satisfied with the physical environment are more likely to produce better work outcomes [5]. User satisfaction is recognized as an important factor in the success of an organization and is regarded as a key indicator of performance. This is based on the rationale that higher levels of satisfaction improve morale and reduce voluntary turnover. Other researchers found that employees’ satisfaction with their work environment is directly related to their job satisfaction and indirectly related to organizational commitment and turnover intention.

In general, studies of the ambient features in office environments—including noise, lighting, temperature, existence of windows and others; suggest that such elements of the physical environment influence employees’ attitudes, behaviours, satisfaction and performance [6]. In his 1995 paper, Andrian Laeman stated that "people who are unhappy with temperature, water quality, lighting and noise conditions in their offices are more likely to say that this affects their concentration at work" [7].

Although some researchers have found significant effects of physical environment features on job satisfaction, behaviour, performance and indirectly affect work concentration and productivity, other studies have failed to confirm a direct relationship between these variables. Therefore, this paper presents the literature reviews on a study of the influence of physical office environments towards employees. Six factors of environments such as the effects of workplace design, indoor temperature, lighting and ventilation, colour, noise and also interior plants towards employees’ well-being and performance are discussed.

1.1 Effect of physical workplace design.

A fundamental aspect of the workplace environment that contributes to such employee behaviour is the layout of office space. Conventional workplace designs tend to provide closed private offices for employees. In contrast, the more contemporary open-plan design is characterized by an absence of floor to ceiling walls and internal boundaries, as illustrated by cubicles or partitioned workspaces [8]. Due to lower costs and convenience, the concept of open-plan office use continues to increase. As mentioned by Smith-Jackson, & Klein (2008), open-plan designs refer to offices with individual workstations placed within an open space; sometimes divided by panels, but also include conventional shared offices with several workers in an office space [9]. When introduced, open office plans were presumed to provide an environment that would increase work efficiency and facilitate communication, while reducing construction and equipment costs.

Meanwhile, according to Brennan, Chugh, & Kline (2002) and Zeitlin, (1969), proponents of the open-plan office suggest that the open plan creates flexible space, allowing for a reduction in set-up and renovation times [10,11]. It also enables the accommodation of greater numbers of employees in reduced amounts of space. As a result the total office space required is reduced and organizations save on air conditioning, maintenance and building costs. Supporters of the open-plan design also claim that the design facilitates communication and increases interaction between employees, and as a result improves employees’ satisfaction, morale and productivity [12]. Indeed, some evidence exists to support these positive effects. Open-plan offices have led to increased communication among co-workers, higher aesthetic judgments, and more group sociability than more conventional designs [13,14,15].
Although physical cost has proven to be lower than the more complex designs requiring separate offices, the predictions of increased efficiency and better communication have yet to be fulfilled. The lack of positive outcomes for workers and productivity may very well negate the savings introduced by a less expensive physical design. Noise is one factor that may undermine the expected efficiency and productivity gains [9]. Moreover, researchers have also reported problems with open offices from the perspective of occupants such as noise, lack of privacy and other distractions [16,17]. According to Hall (1966), individuals have their own personal space which, when violated, lead them to feel crowded and uncomfortable [18]. Thus, when infringements on personal space intrinsic to the open-plan design exceed employees’ comfort levels, feelings of crowdedness and loss of privacy are likely to emerge. These feelings of crowdedness and loss of privacy then result in the dissatisfaction and negative reactions displayed by employees working in open-plan workspaces [19]. Chan in his 1999 paper, stated that two common factors affecting privacy are limited personal space and excessive unwanted interaction [20].

Several studies have found evidence that open-plan offices are related to decreased job satisfaction, reduced motivation, and lower perceived privacy [21]. Other studies examining subjective reports of employees in open-plan offices have identified irrelevant speech as a factor linked to negative perceptions of the workplace, lower productivity, and stress (Becker, Bield, Gaylin, & Sayer, 1983; Kupritz, 1998; Nemecek & Grandjean, 1973; Rivlin & Weinstein, 1984; Sundstrom, Town, Rice, Osborn, & Brill, 1994) [22, 23,24,25,17]. Workers in open-plan offices have reported that conditions are stressful and further examinations of these environments have found some support for a relationship between open-plan designs and fatigue, irritation, generalized distress, and health complaints, i.e. headaches and respiratory infections [26].

Open plan design and space of the workplace are not the only factor that contributes to employees’ work disruption. Myriam B.C. Aries et.all (2010) states that the physical arrangement of the office environment influences the level and type of social interaction between employees [27]. According to Vischer & Jacqueline (1989), the good of physical office arrangement is important to [28]:

- Helps workers perform their tasks more quickly, easily and efficiently.
- The planned layout also allows more space to maximum use and economy.
- Supervision and monitoring of workers becomes easier.
- Communication system becomes easier and faster.
- It provides comfort as well affect the behavior and employees’ works.

While Nur Adibah Matharuddin (2003), suggests five aspects to be considered in physical office arrangement:

- The smoothness of work among officers and employees.
- Work efficiency among officers and workers as well as conditioning of the work area workers who have the same characteristics must be considered.
- Equipment and forms - should be placed and arranged systematically.
- References files - must be made available easily.
- Light like source of electricity, artificial light etc - must be sufficient.
- Air circulation – has to be adequate.

1.2 Effect of indoor temperatures on performance

Numerous studies have shown that indoor climate impacts both health and performance, which in turn affect productivity. Discomfort factors can decrease employees’ focus on their works. However, employees can focus more when high temperature is reduced by the use of air conditioning equipment. Several studies conducted by Lorsch and Abdou (1994), "shows that when the air-conditioning system was introduced, employees feel that their work space becomes more comfortable and the productivity tends to increase by 5-15 percent because they can concentrate on their work [28]. This statement explains that when an employee feels comfortable with the workplace environment, things that can distract their work can be reduced and they can perform better.

Hence, from the literature review by other researchers indicate that productivity decreases by 2% per each degree over 25°C and presented the link between a decrement in productivity and high indoor
temperature. Heat can cause lethargy which not only increases the rate of accidents but can also seriously affect productivity. Therefore as a conclusion it is indirectly explained that the office environment would influence the actions of an employee. Cramped, disorganized, dirty and dusty work space could also give pressure to employees and this could affect their work.

1.3 Influence of colour in office environment

Colour is a visual phenomenon triggered by the response to the stimulation of light. It pervades every aspect of our lives, embellishes the ordinary and gives beauty and drama to everyday objects [30]. Colours in the office workplaces are very important to ensure efficiency in the working environment. Each colour has different effects on the human body. Everyone experiences colour in their own personal way. People’s are reactions to different colour schemes depend on their culture, education, genetics and socio-economic level. As a result, behavior and productivity in the workplace are heavily influenced by space, structure, colour, lighting and activity.

Garris and Monroe (2005) state that colour influences not only mood but also wellness and productivity [31]. As mentioned by Syahrul Nizam & Emma Marinie (2010), colours also affect psychological aspects of the building’s occupants. Some colours provide calmness, some provide comfort, some are stimulating and many others have an impact in different ways [32]. This means that colour will affect the mood of the occupant of the space. So, appropriate colour should be chosen to ensure the mood of the employees is good in order to encourage productivity. Productivity is rarely correlated with colour. However, the colour scheme does play an important role in the working environment.

According to Farshchi and Fisher (1997), the character of space affects human emotions and behaviour. In space configuration or arrangement, colour also plays an important role in influencing either large or small areas [33]. For instance, a long, narrow room can be made to seem more normal if the end walls are painted in warm, deep and intense colours, while the side walls are painted in lighter, less saturated colours. A low ceiling will seem less oppressive if its colour is light while a high ceiling can be made to seem lower by a dark blue, grey or black [34]. Comparison of the same size of two room’s results that room with the darker colour scheme will appear to be smaller than the other room with a lighter colour scheme.

Jobs that require great concentration require a neutral colour scheme, jobs like those of accountants and attorneys require a stronger a colour scheme, while journalists would perform best in exciting and energetic colours with great contrast value. Meanwhile, O’Brien (2007), suggest that a blue office is ideal for someone who must focus and concentrate on numbers, green is a great choice for a management office as it has a balancing effect, and yellow is suitable for sales offices [35]. Therefore, the colour scheme chosen for a workplace or an office must be made with proper consideration to produce better quality of work. If unsuitable colours were chosen, employees might be subject to negative psychological impacts such as stress, depression, dullness or boredom.

As a conclusion, it is clear that colour assists in creating attention. This is crucial for workers especially in work performance. Without concentration and attention, the work done will be low in quality and productivity. Therefore, consideration of colour to improve productivity should be made with proper guidance.

1.4 Noise as a psychosocial stress

Sound or noise problem in an office is something that could not be avoided. Studies have shown that when sound is turned off, errors in work are reduced and productivity increases. Sundstrom, Town, Rice, Osborn, and Brill (1994) identified noise as an ambient stressor relating to job satisfaction in the work environment [17]. According to Loewen and Suedfeld in their 1992 paper, mentioned that noise not only containing speech, but sound produced by phone, copier, and keyboard. The disruption in performance cannot be attributed to the presence of speech alone [36].

Smith (1989) reviewed the effects of noise on performance. Despite an extensive review, Smith concluded that noise effects are still unclear, and that beyond intensity issues, researchers need to analyze the questions of what type of noise at what intensity affects which type of task performance [37]. Other
studies have found that open office noise can be stressful and demotivating [38]. As jobs become more technologically complex, the frequency of stress-related disorders in work environments increases [39]. Office workers, in particular, consistently report “the ability to concentrate without noise and other distractions” to be one of the most important aspects of the work environment [40].

According to Denyer J.C (1969) there are several steps that can be implemented by management to reduce noise levels in an office such as [1]:

- Install a sound absorbent material on the ceiling, walls and floors of the office. Sound absorbent screens can also be installed for office space that uses landscape concept. In addition, the use of thick curtains on the windows can also reduce unwanted noise.
- Install 'felt pads' on typewriters and other machines that produce sound to reduce noise.
- Changing the ringing phone to the 'buzzers' system, 'light indicators' or 'bleeps' to reduce noise.
- If necessary, a small room in an office can be provided for the purpose of discussion or an appointment of personnel to avoid interference from outside.
- Noise impacts can be reduced by installing a floor covering such as carpet and so on.
- The facility manager or management must ensure that employees who interact with a tone so as not to disturb the focus of the work of others. Although this is somewhat trivial, but it is practical to reduce noise in the office.

1.5 Influence of Interior Plants on Employees

Interior plants are common in many homes, work places, and commercial settings. According to Sundstrom, E. (1986), in the 1960s, the open-plan ‘office landscape,’ characterized by the abundant use of large potted plants to separate work spaces, was popular [17]. Sethi, A.S et. all, (1987) agreed that although the office environment has changed over time, interior plants continue to be used in work spaces [41]. Relf. D. (1990) reports that interaction with plants, both passive and active can change human attitudes, behaviors, and physiological responses [42]. The stress-reducing benefits of passively viewing plants in natural settings are well documented [43]. Therefore as mentioned by Relf D (1990), the need for a thorough understanding of the relationship between plants and human well-being is increasingly important [42].

A few studies done by researchers indicates that office workers are reported to be less tired when they have access to plants or window views, and prefer work environments with living plants and window views. Furthermore, he also reported that natural environments can have a restorative effect on attention.

Conclusion

From the literature reviews, it is very clear that indoor environments in an office has a great influence on employees’ attitudes, behaviours, satisfaction and works performance. As stated by Andrian Laeman (1995) in his research, "people who are unhappy with temperature, water quality, lighting and noise conditions in their offices are more likely to say that this affects their concentration at work" [7]. Others research have also shown that productivity bears a close relationship to the indoor environment quality. However, how to assess the effect of indoor environment quality on productivity remains to be the major challenge.

Therefore, it can be concluded that not only temperature, water quality, lighting and noise should be taken into consideration, but also the indoor air quality, thermal comfort, layout of individual workspaces, workplace colour schemes, interior plants, dust levels and biological contaminants, indoor carbon dioxide concentration and many other factors should be considered by the top management of organizations. For future research is great if researchers could investigate on the relationship between productivity of office workers and their indoor office environments. The studies perhaps could be compared between government office environments and private sectors.

Finally, a comfortable working environment is important to enable employees to focus and do their job perfectly. This will ensure the quality of life at work as well as performance of office workers for better organizational performance.
References