Effects of Collaborative Workspaces on Employee Satisfaction and Productivity

September 2013

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At **EWI Works**, occupational ergonomics is our core business. Our commitment to providing effective solutions, rather than just simply identifying issues, has allowed EWI Works to stand apart from other service providers.

Executive Summary

Open-plan workspaces in offices are becoming an increasing trend among companies. Employers tend to prefer the open-plan office design because of decreased associated costs, claims of increased communication, and collaboration among employees, which is said to increase office productivity. Workspace designs can fall under a variety of different designs, which may vary with respect to the degree of privacy. Therefore, it is important that when discussing workspaces, the degree of openness of a workstation be considered. When examining office designs, five categories are frequently used. Offices that fall under a closed plan design are: (1) enclosed private office and (2) enclosed shared office. Offices considered open-plan designs are: (1) cubicle with high partitions, (2) cubicle with low partitions, (3) workspace with limited or no partitions.

Typically, two types of data have been used to evaluate the impact of open office plans – employee productivity and satisfaction. Employee satisfaction has been evaluated using surveys administered to large groups of office workers. Employees situated in open-plan offices reported significantly lower perceived job satisfaction regarding multiple indoor environmental quality factors. The major concerns arising with open-plan office designs were a lack of satisfaction with respect to acoustic privacy, noise level, and visual privacy. Interestingly, a study comparing employee satisfaction among varying degrees of open-plan workstations found that those in cubicles with higher partitions reported being more unsatisfied with most indoor environmental quality factors than those in cubicles with low and limited partitions. These results lead researchers to believe that while the high partition cubicles provide increased visual privacy, they also provide a false sense of acoustic privacy, which leads employees to be more dissatisfied than, if they have less perceived privacy. Employee satisfaction with their environment is strongly correlated to access to windows and natural light. Employees are more satisfied when they have access to a view and natural daylight. However, if an employee's workstation contains a window satisfaction may decrease due to difficulties in controlling temperatures and glare. Employees in high partitions tend to be more dissatisfied with access to overall light levels (natural and artificial lighting). Therefore, a partition height of approximately 5 feet may allow adequate access to natural light but also provide adequate visual privacy for employees. More research is still required concerning partition height and access to windows.

A second major claimed benefit of open-plan workspace designs is an increase in employee productivity through increased communication. Not only have employees reported on questionnaires that the lack of perceived privacy in open-plan designs discourages communication, but the open-plan design seems to have a detrimental effect on productivity as well. Excessive environmental noise levels have been identified as a major source for dissatisfaction among employees, and a large source for decreased workplace productivity in open-plan office designs. Many field studies have found that different types of noise have different effects on reported disturbance in work productivity. For example, predictable sounds such as ventilation, machinery humming, or outside traffic are less likely to be reported as disturbing than variable and unpredictable noise such as people talking, phones ringing, and people passing by in hallways[8]. Perceived productivity is reported to be most affected by loud intelligible but irrelevant speech.

If open plan offices are utilized it is recommended that multiple breakout rooms be provided to offer private spaces for employees to conduct meetings and phone calls. Furthermore, open-plan office policies should be designed and implemented to help all employees adapt to a new workspace design. Finally, increasing an employee's perceived control over their workspace via hoteling and coping strategies will help to increase satisfaction and help to ease environmental distractions.

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Effects of Workspace Collaboration on Employee Satisfaction and Productivity

Introduction

Defining Workspace Designs

In recent years, collaborative work has been a driving factor in the emergence of the use of open plan work spaces as a design trend. Workspaces have a wide variety of office designs ranging from a private enclosed office to a completely open desk workspace. Open-plan workspaces are defined as workspaces that are located within a large open space with multiple employees[1]. However, open-plan workspace designs can differ based on a variety of factors such as the number of partitions dividing an employee's workspace from other workspaces, the height of the partitions used to divide workspaces, or a complete lack of partitions. Therefore, it is important to consider the degree of openness a workstation has when labelling it as an open-plan workstation. When comparing workspace design, 5 categories have been frequently used to specify the type of office[2,3].

Office Type	Description
Closed-Plan Design	
Enclosed Private Office	Single person in the room, ability to shut the door for privacy
Enclosed Shared Office	2-3 people sharing an enclosed room, typically performing similar work
Open-Plan Design	
Cubicle with High Partitions	Partitions are 5 feet or higher, cubicle in a common workspace shared by others
Cubicle with Low Partitions	Partitions are less than 5 feet, cubicle in a common workspace shared by others
Workspace with limited or no partitions	Workspace may have no partitions or minimal partitions, workspace in a common area shared by others

Trends in Design (Reasons why)

Open-plan office designs peaked in popularity in the 1970's but recently have been re-emerging as a new design favorite with the increasing number of employees of today's workforce performing knowledge-based work which is completed in an office setting[6]. Open-plan offices are popular among employers as the designs allow for flexible workspaces, which reduce time required to setup and renovate spaces. These changes also allow for an increased number of employees to fit into the same space requirements, which further decreases building, maintenance, and electricity costs[1,6]. Proponents of open-plan office designs claim a big benefit to this design is the increased ability and promotion of communication and interactions between employees that lead to an increase in productivity and employee satisfaction[6]. The Social Facilitation Theory states that people who are bored at work performing routine job tasks are more likely to be motivated when in non-private working environments because of the extra contact with other people4.

While this may be appropriate for the routine tasks, it may not be so applicable to today's office worker in which knowledge work is very integrated and requires a lot of focus and concentration.

Open-Plan Workspace Design and Employee Satisfaction

Satisfaction Differences in Open versus Closed-Plan Designs

The push towards an open-plan workspace design has been promoted through the claim of increasing employees' job satisfaction. Job satisfaction among employees is an important factor for ensuring employees are more motivated to work, and are more productive. A survey administered to 491 office employees showed that office type has an effect on employees' self-reported health, well-being and job satisfaction[5]. Open-plan offices scored the lowest on survey ratings with respect to perceived health and job satisfaction[5]. Similar satisfaction differences have been reported in office worker surveys where after a move from a closed-plan office to an open-plan office employees reported increased ratings of overall dissatisfaction particularly concerning privacy[2,3]. Employees prefer to have privacy over ease of accessibility for communication[2].

A large-scale questionnaire administered to 42 764 office employees by the Center for the Built Environment (University of California, Berkeley) had employees rate their satisfaction with a variety Indoor Environmental Quality (IEQ) factors. A recent study used relevant IEQ factors to compare job satisfaction in different office layouts[3]. Clients rated their satisfaction with respect to thermal comfort, air quality, lighting, acoustic quality, office layout, office furnishings, cleanliness and maintenance, and overall satisfaction. Employees were located in one of the five office layouts described in the introduction. Employees with the highest overall satisfaction reports for all categories were located in private offices. Interestingly, reports of ease of communication were no higher in open plan offices than they were in enclosed offices[3]. High concerns over lack of acoustic privacy in open-plan offices were in fact reported to hinder an employee's communication for fear of being overhead[2].

Acoustic Quality

The two most predominant factors causing decreased employee satisfaction in open-plan offices are related to acoustic quality; sound privacy, and noise level[2,3,6]. Sound privacy is the employee's perceived ability to not be overhead by co-workers during conversations, and the noise level is the amount of noise that is not relevant to the employee's task.

The Overstimulation Theory explains that, a combination of excessive social interaction and communication, with only minimal amounts of personal space can over stimulate an employee, this can cause an employee to have a negative emotional response often leading to dissatisfaction[7]. An employee's perceived control over distractions and interactions in the office is an important predictor of job satisfaction[13]. Therefore when employees are located in an open-plan office with no control over who they are interacting with, their satisfaction will likely decrease.

Satisfaction Differences in Varying Degrees of Open-Plan Designs

To further examine the open-plan design, research has shed some light on the differences in job satisfaction within the varying degrees of open-plan designs[2,3,6]. Open-plan offices typically come in one of three

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designs, high partitions, low partitions, and no/limited partitions. When asked to rate their satisfaction on a variety of environmental factors, cubicles with high partitions reported the lowest satisfaction for 13 out of 15 of the environmental factors[3]. Interestingly, although still not satisfied, employees with limited or no partitions were less dissatisfied with most of the factors (including acoustic privacy) except for visual privacy than employees in high partition cubicles were.

Employees in high-partitioned cubicles reported the lowest satisfaction with respect to sound privacy out of all three open-plan deigns[3]. Although the higher partitioned walls help to improve employees' visual privacy, they are not effective enough to improve sound privacy. It has been suggested that non-relevant noise becomes more disruptive with higher partitions because employees cannot easily identify the source of the noise[3,6]. Furthermore, it is thought that satisfaction is decreased in higher-partitioned cubicles (in comparison to low partitions and limited partitions) because the higher partitions make it appear that there will be increased privacy. When this privacy is not achieved, it leads to increased dissatisfaction among employees[6].

Employee Satisfaction Related to Window Proximity

It has been well documented in literature that employees prefer access to natural light over artificial light, and the vast majority of office workers prefer to have their workspace located near a window[17]. Lacking access to windows has psychological effects on employees, altering their attitudes towards their workspaces and their overall satisfaction[16, 17]. A study examining employee satisfaction with workspaces in two separate open-plan environments found that the closer an employee is to a window, the more satisfied they are with their work environment which seems to counteract some of the variables (such as lack of privacy and increased noise levels) that tend to cause dissatisfaction among employees in open-plan offices[16]. The two open-plan office designs had partition heights of either 1.2 meters or 1.4 meters. Employees with partition heights of 1.4 meters who were located near a window reported the highest satisfaction rates[16]. These higher satisfaction rates are thought to be a result of a combination access to a window as well as added visual privacy.

While open-plan office designs improve upon lighting and access to windows[18], it is also evident that people are more satisfied with their environment if they have access to daylight but do not have a window in their workstation. When employees are directly beside a window it is often more difficult to regulate temperatures and glare, leading to dissatisfaction with the environment. Partition height of a cubicle will play an important role in environment satisfaction with respect to access to daylight. When surveyed about satisfaction with the amount of light in their workstations, employees with high partitions (greater than 5 feet) were the more dissatisfied than employees in workstations with low or limited partitions were[3]. Literature has not specifically addressed the effects on partition heights and proximity to windows with respect to environmental satisfaction, but a partition height of close to 5 feet in height may provide an optimal balance of privacy and access to natural light.

Suggested Methods for Improving Satisfaction among Open-Plan Designs

Increasing the number of breakout rooms available to employees is a good strategy to improving employees' feelings of satisfaction with respect to acoustic privacy. This will provide adequate space to allow employees to hold private meetings and telephone calls without the fear of being overheard, and should help to increase communication[2]. Open-office protocols should be established and enforced in open-plan offices, these protocols should address where conference calls and meetings should be held including informal meetings[2]. Extra effort should focus on providing employees with adequate perceived space and

storage, and enable them to have a perceived level of control over their own workspace. When employees are given a small amount of control over their workspace (such as control over task lighting, or the temperature at their workspace), their satisfaction is increased and they are more likely to be satisfied at work[13].

An important strategy that has been alluded to in studies is hoteling. Hoteling is the opportunity for employees to sign out a private office (or breakout room) for a period of time when high concentration is needed. Having the option to work in a private setting when an employee feels it is necessary is a way to increase perceived control over the physical work environment. Another strategy to allow for control is the use of availability signs which can be hung at the entrance to a cubicle. A sign can be used as a method for an employee to display they are busy and do not wish to be disturbed during times of high workload. Finally training sessions could be provided which educate employees on coping strategies to deal with distractions that are associated with open-plan offices (such use of headphones, ear plugs and techniques to address concerns). If employees feel capable of inhibiting distractions perceived control over the workspace may increase and help to increase satisfaction.

Open-Plan Workspace Design and Employee Productivity

As findings from employee satisfaction in open plan offices may suggest, external noise in an office can be a major distracter and effectively cause a loss in employee productivity. Many discussions and studies have attempted to quantify office productivity as a means for comparing different office designs. Unfortunately, the nature of most office work is so different, that productivity is difficult to compare[14]. The biggest environmental factor that is likely to affect employee productivity in open plan designs is background noise levels[1,5]. Many field studies have found that different types of noise have different effects on reported disturbance in work productivity. For example, predictable sounds such as ventilation, machinery humming, or outside traffic are less likely to be reported as disturbing than variable and unpredictable noise such as people talking, phones ringing, and people passing by in hallways[8,15].

When considering open-plan office designs, individual characteristics of employees and task complexity are two important factors that contribute to the success of the design. Studies have found that some employees are more capable of screening out unwanted external stimuli such as irrelevant background speech, and telephones ringing, etc. People who are less influenced by these noises have been labelled as highly productive in open-plan offices versus those who are very influenced by external noise sources[6,15]. Therefore, an employee's success in an open-plan office is suggested to be predicted based on their ability to screen unwanted and irrelevant stimuli, whether they be visual or acoustic[6,15]. There has been mixed findings regarding whether complex tasks or less complex tasks are more likely to be affected by irrelevant stimuli present in open-plan offices. However, the majority of literature claims that employees performing more complex tasks are more likely to be distracted which will affect their work productivity[6]. Employees performing less complex tasks are less likely to be affected by distractions[6].

Since office productivity is difficult to quantify for each individual employee, studies have used skilled tasks such as reading comprehension, proof reading, mental arithmetic, and verbal short-term memory tests to quantify losses in productivity[1,8,9,15]. Because of the increased rate of dissatisfaction among open-plan office workers with respect to noise levels, noise is of particular concern with respect to employee productivity. It has been suggested that interruptions in performance (and therefore also productivity) are caused when processes in the task conflict with the processing of the background noise.

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Irrelevant Background Speech and the Effects on Employee Productivity

A few theories have been developed to explain the problems that occur with background speech and employee productivity. The Irrelevant Speech Effect explains that when speech is present in the background and a person is trying to perform a cognitive task, the employee is disrupted only if the speech is intelligible and meaningful[10]. Furthermore, the Changing-State Hypothesis suggests that any time there is an abrupt change in tone or sound, the mind automatically processes the change, and this process becomes disruptive because of a person's inability to ignore the changes in noise, which is a fundamental characteristic of speech[11].

A review of studies examining the effects of office noise and employee productivity determined that irrelevant background speech increases mean errors as much as 4-45% depending on the task[12]. The magnitude a task is affected by background noise was the highest when speech was not muffled and perfectly heard[12]. This is supported by questionnaires completed by employees where speech was reported to be the more annoying and disturbing noise condition followed by masked speech, and then continuous noise was reported as the least disturbing noise[8]. Employees' subjective disturbance ratings revealed that loud intelligible speech is the most disturbing with respect to productivity, the disturbance is decreased when the speech becomes softer and quieter but is still higher than when working in complete silence[9].

Conclusion

In conclusion, private enclosed workspaces have the highest reported employee satisfaction and perceived productivity. Studies have found no differences in perceived ease of communication with coworkers between employees in private offices and open-plan offices. If an open-plan office design is to be implemented care should be taken into the design process to maintain a positive employee morale. Major reasons for dissatisfaction in an open-plan design office are caused by a lack of perceived acoustic privacy, a lack of perceived visual privacy, and increased ambient noise levels among the office. High panels increase employee satisfaction with respect to visual privacy, employees in cubicles with low partitions and limited partitions report being dissatisfied. Alternatively, employees in cubicles with high partitions are more dissatisfied by ambient noise levels and acoustic privacy than employees in cubicles with low or limited partitions. Multiple breakout rooms should be provided to offer private spaces for employees to conduct meetings and phone calls. Furthermore, open-plan office policies should be designed and implemented to help all employees adapt to a new workspace design. Finally, increasing employee's perceived control over their workspace through hoteling and coping strategies will help to increase satisfaction and help to ease environmental distractions.

With the proper use of breakout rooms and a properly designed open-plan office policy, ambient noise in the office should be reduced which will help to decrease the detrimental effects of noise distractions on employee work productivity. Irrelevant background speech is one of the most distracting factors for employees with respect to workplace productivity. If this noise can be minimized in open-plan designs, employee satisfaction and perceived productivity will likely be increased.

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