

To study the effect of presence of indoor plants on self perceived productivity of employees

Dr. Gurkirpal Singh

I K G Punjab Technical University, Jalandhar, Punjab, India

Received: May 08, 2018

Accepted: June 13, 2018

ABSTRACT

The fact that people spend about 90% of their time indoors has made the implications of the indoor environment very important to designers and architects. Building performance with respect to architecture has gained increasing attention in recent years. Studies have shown that peoples' mood may be affected by plants although they concluded that further research was necessary in Indian setting. Aim of this study is to study the effect of presence of indoor plants on self perceived productivity of employees. A total of 660 employees from various offices of Chandigarh were recruited as sample. The age range of the sample was between 25 to 60 years. The questionnaire used was an adapted and modified version of already existing scales of occupants' satisfaction with indoor environment quality (IEQ) components of other buildings by different researchers. Results indicate that employees productivity is positively correlated with presence of indoor plants. It can be safely concluded that it should be of great interest to include plants as a work environment asset, since only small investments are necessary in order to establish a "green" indoor environment.

Keywords: environment, indoor plants, perceived satisfaction, correlate, Design, Built environment.

Introduction

There is an increasing interest in workplace environments that promote health/well-being. Researchers and health agencies are trying to pinpoint 'soft' aspects of the built environment that enhance wellbeing and comfort, and reduce absenteeism (Cole et al., 2008; Aries et al., 2010). Research has indicated that improving the working environment reduces complaints and absenteeism and increases productivity (Roelofsen, 2002).

Plants enhance productivity by 12% while deflating the mounting problem of workplace stress. Live interior plantscapes actually were Operating & Maintenance (O&M) costs – energy and cooling as well as grounds maintenance expenses. Interior plantscapes are dramatically improving both the recruitment and retention of top employees in today's tight, mobile job market. Interior plants increase aesthetic value, enhancing customer and employee perception of the property. Plants have proven to be an economical way to manage the growing risks and liabilities associated with poor indoor air quality (IAQ). And finally, plants absorb sound, contributing to heightened productivity levels (Gilhooley, 2002). Fjeld and Bonnevie (2002) reported that use of indoor plants may affect productivity, work satisfaction and even absence due to sickness.

Shibata and Suzuki (2002) found that peoples' mood may be affected by plants although they concluded that further research was necessary. Aim of present study is to study the relationship between presence of indoor plants and perceived productivity of the employees.

Methodology

Sample

A total of 660 employees from various offices of Chandigarh were recruited as sample. The age range of the sample was between 25 to 60 years. The employees who were working for the last three years in a particular organization were considered for inclusion in this study. The minimum educational qualification of the selected subjects was graduation.

Questionnaire

The data collection instrument for this study was a structured questionnaire developed by the researcher with the help of experts. The questionnaire is adapted and modified version of already existing scales of occupants' satisfaction with indoor environment quality (IEQ) components of other buildings by different researchers. The questionnaire items were developed to reflect the satisfaction/comfort/Productivity components of the office environment. The questionnaire for the study contained 44 total items pertaining to employees' general demographics and satisfaction with thermal, acoustic, and lighting conditions.

Data Analysis

For result findings and in-depth analysis of the different components of office environment on the productivity of the office employees, statistical techniques of correlation has been used. SPSS 16 software as research tool for data analysis was used for this research.

Results and Discussions

Table 1: Descriptive Statistics

Variables	Mean	Std. Deviation	Respondents (N)
Productivity	3.6114	.73930	660
Indoor Plants	2.6049	.84892	660

Table 2: Coefficients of Correlations between Productivity and Element of Office Design

Sr. No.	Variable	(r)
1	Indoor Plants	.359**

** Significant at .01 levels

It is clear that employees productivity is positively correlated with satisfaction with exposure plants in the office environment. The obtained findings are consistent with earlier research (Ulrich, 1984; Kaplan and Kaplan, 1989; Wolverton, 1989; van der Wal , 1991; van der Wal and Hoogeveen, 1993; Klein Hesselink and Hopstaken, 1995; Fjeld ,1995; Lohr et al.,1996; Dortmund and Bergs, 1997; Fjeld, 1999; Van Dortmund, 2001; Klein Hesselink et al., 2006; Larsen et al., 1998; Lohr et al., 1996; Loomans and Klein Hesselink, 2005; Schempp, 2002; Shibata and Suzuki, 2001; Shibata and Suzuki, 2002 ;Ulrich, 2002; Fjeld and Bonnevie, 2002; Wolf, 2002 ,Wood et al., 2002; Wood et al., 2004; van den Berg and WinsumWestra, 2006). Incorporating plants into the office has been proven to be beneficial to one's health and wellness. Plants can help reduce stress and sickness, which will increase productivity, cognitive attention, and limit absences. In addition, plants can help reduce noise, increase creativity, and can help provide cleaner air for everyone by filtering out bacteria and mold. Plants or greenery is not an independent factor in the perception of quality in and of itself. Greenery can have an influence through the other factors, especially air quality and arrangement of the workplace (aesthetic). Plants can also have an indirect influence on neurological health factors (influencing stress). Plants are capable of absorbing numerous (chemical) pollutants in the air. Plants increase the relative air humidity. Especially in the winter, when complaints about dry air are most frequent, plants can help alleviate the problem. Their influence is only limited in offices with natural ventilation systems, but the effect on both air quality and relative humidity can be larger in buildings with mechanical ventilation.

Conclusion

It can be safely concluded that it should be of great interest to include plants as a work environment asset, since only small investments are necessary in order to establish a "green" indoor environment. In addition – and probably just as important - the personal well-being and the quality of the everyday working situation may be increased for the employees.

References

1. Cole, R. J., Robinson, J., Brown, Z., and O'Shea, M., (2008), "Re-contextualizing the Notion of Comfort," Building Research and Information, 36(4), pp. 323-336.
2. Aries, M.B.C., Veitch, J.A., and Newsham, G. R., (2010), "Windows, View and Office Characteristics Predict Physical and Psychological Discomfort," Journal of Environment Psychology, 30, pp. 533-541.
3. Dortmund, J.F., and Bergs, J.A., (1997), "Planten en productiviteit (Plants and Productivity)," Bloemenbureau, Leiden.
4. Gilhooly, M. J. (2002), "Green Grass of Work. Facilities Design & Management," from http://www.iuoe.org/cm/iaq_greenbuild.asp?Item=447, Assessed on September 19, 2014.
5. Fjeld, T. & Bonnevie, C., (1999), "Planter i innemiljø – et hjelpemiddel for bedre arbeidsmiljø?" Ramazzini, 6(1), pp.22-25.
6. Fjeld, T., (1995), "The Effects of Interior Plants for Offices", Paper presented at the Symposium Plants for People, Amsterdam.

7. Fjeld, T., and Bonnevie, C., (2002), "The Effect of Plants and Artificial Day-Light on the Well-Being and Health of Office Workers, School Children and Health Care Personnel," Seminar Report: Reducing Health Complaints at Work Plants for People, Int. Hort. Exhib. Floriade.
8. Klein Hesselink, J., and Hopstaken, L., (1995), "Planten op het werk (Plants in the Working Environment)," NIA, Amsterdam.
9. Klein Hesselink, J., de Groot, E., Loomans, M. and Kremer, A., (2006), "Fysiologische en psychische en gezondheidseffecten van planten in de werksituatie op gezondheid en welbevinden van mensen (Physiological and Mental and Health Consequences of Plants in the Work Situation on Health and Well-being of People)," TNO rapport 21573/018.10311, TNO Kwaliteit van Leven, Hoofddorp.
10. Kaplan, R., and Kaplan, S., (1989), *The Experience of Nature: A Psychological Perspective*, Cambridge University Press, New York.
11. Larsen, L., Adams, J., Deal, B., Kweon, B.S., and Tyler, E., (1998), "Plants in the Workplace: The Effects of Plant Density on Productivity, Attitudes, and Perceptions," *Environ. Behavior*, 30, pp. 261-281.
12. Lohr, V.L., Pearson-Mims, C.H., and Goodwin, G.K., (1996), "Interior Plants may Improve Worker Productivity and Reduce Stress in a Windowless Environment," *J. Environ. Horticulture*, 14, pp. 97-100.
13. Loomans, M., and Klein Hesselink, J., (2005), "Het effect van planten op het werk" (The Influence of Plants in the Working Environment)," *Facility Management Magazine*, 133, pp. 17-21.
14. Roelofsen, P., (2002), "The Impact of Office Environments on Employee Performance: The Design of the Workplace as a Strategy for Productivity Enhancement," *Journal of Facilities Management*, 1, pp. 247-264.
15. Shibata, S., and Suzuki, N., (2001), "Effects of Indoor Foliage Plants on Subjects' Recovery from Mental Fatigue," *North American Journal of Psychology*, 3(3), pp. 385.
16. Shibata, S., and Suzuki, N., (2002), "Effects of the Foliage Plant on Task Performance and Mood," *J. Environ. Psychol.*, 22, pp. 265-272.
17. Schempp, D., (2002), "Green Architecture, Plants in Buildings; Key Message Plants for People", Paper presented at the International Symposium, Floriade.
18. Ulrich, R. S., (2002), "Health Benefits of Gardens in Hospitals" Paper for Conference, Plants for People, International Exhibition, Floriade.
19. Ulrich, R., (1984), "View through a Window may Influence Recovery from Surgery," *Science*, 224, pp. 420-421.
20. van den Berg, A. and Winsum Westra, M., (2006), "Ontwerpen met groen voor gezondheid" ("Designing With Plants Creating Health"), *Reeks Belevingsonderzoek*, No. 14, Alterra rapport 1371.
21. van der Wal, J.F., (1991), "Oriënterend onderzoek naar de luchtzuiverende werking van potplanten in een mechanisch geventileerde proefruimte (Orientation Study Concerning the Air Cleansing Functioning of Pot Plants in a Mechanically Ventilated Test Space)," TNO rapport, TNO Bouw, B-91-0137, TNO, Delft.
22. van der Wal, J.F., and Hoogeveen, A., (1993), "Onderzoek naar de regeneratie van actieve kool door potplanten (Study Concerning the Regeneration of Active Cabbage by Pot Plants)," TNO rapport, TNO Bouw, B-92-1155, TNO, Delft.
23. Dortmont, A. van, and Bergs, J., (2001), *Onderzoek planten en productiviteit (Study on Plants and Productivity)*, Leiden, Bloemenbureau, Holland.
24. Wolf, K.L., (2002), "Het effect van natuur in en rond winkelgebieden; creatie van een consument gerichte leefomgeving", ("The Impact of Nature in and Around Shop Areas; Creation of an Environment Specifically Suited to a Consumer"), Paper presented at the People/Plant Symposium, Amsterdam.
25. Wolverton, B.C., (1989), "Interior Landscape Plants for Indoor Air Pollution Abatement," NASA, John C. Space Center, USA.
26. Wood, R., Orwell, R., and Tarran, J., (2004), "Planten om de luchtkwaliteit van een kantoor te verbeteren (Plants to Improve Office Air Quality), Final report of Office "On-Location", Flower Council of Holland, Sydney.
27. Wood, R.A., Burchet, M.D., Tarran, J., and Torpy, F., (2002), "Het vermogen van planten/aarde om schadelijke stoffen uit vervuilde lucht binnenskamers te verwijderen" ("The Capacity of Plants/Ground to Remove Indoor Detrimental Substances out of Polluted Air"), *Journal of Environment, Horticulture and Biotechnology*, 77(1), pp.120-9.