

# Assessing Comfort in Open-Plan Offices on Campus – Which Comfort Parameters Matter?

Katja Knecht, Nick Bryan-Kinns, & Karen Shoop  
Queen Mary University of London, London, UK

## Introduction

Previous research has shown that perceived comfort impact well-being and productivity at work (Leaman and Bordass, 2005). However, comfort is a highly individual and adaptive process, which takes place on physical, functional and psychological levels and which is influenced by a multitude of environmental and social factors (Vischer, 2008, Vischer and Wifi, 2015). Problems arise especially in shared work environments such as open-plan offices, in which the level of individual control over these and consequently the possibility to achieve personal comfort is limited.

Open-plan offices therefore constitute an interesting subject of research in regard to individual comfort. In our work, we chose in specific to look at open plan research environments, which are characterised by a high level of flexibility and variability regarding work and office hours, workplace choice, as well as varying task descriptions. Furthermore, research work is to a large extent individual work and performed independently.

To uncover the parameters affecting comfort in these specific open plan work environments we conducted an online survey among PhD students on campus in the scope of a pilot study on individual comfort. We collected both quantitative as well as qualitative information using Post Occupancy Evaluation (POE) questionnaires to paint a more holistic picture of the existing Indoor Environmental Quality (IEQ).

## Materials and Methods

In July/August 2014 we invited PhD students at the School of Electronic Engineering and Computer Science (EECS) at Queen Mary, University of London, to participate in an online survey on long term comfort in their workplace.

The choice of IEQ parameters and question design of the quantitative section was based on sample POE and IEQ surveys, in particular the occupant IEQ survey by the Center for the Built Environment (n.d.) and included the following parameters: temperature, air quality, amount of light, visual comfort of lighting, visual contact with the exterior, level of noise, sound privacy, layout, visual privacy, office furnishings, the level of individual control, cleanliness, ease of interaction, and general work atmosphere. We asked participants to rate their satisfaction with these parameters as well as their overall satisfaction with the personal workspace and the general work environment on a seven point rating scale from 7 (“very satisfied”) to 1 (“very dissatisfied”).

In order to allow additional topics to surface as well as generate a qualitative picture of the comfort landscape as experienced by PhD students, we included two mandatory open-ended questions. We asked participants to describe in their own words, what they liked and disliked about their workspaces at Queen Mary. Furthermore, we gave participants the opportunity to leave comments on particular parameters as well as on other issues, which had not been addressed.

## Results

We received 22 answers to our call; 18 participants had a desk space assigned in an open-plan office in one of the two faculty buildings on campus, the remaining 4 participants worked in an open study and workspace on the premises.

### Occupant Satisfaction with IEQ Parameters

The mean satisfaction ratings with different environmental, indoor and social parameters are depicted in figure 1. The IEQ parameters sound privacy, air quality, temperature, and cleanliness received the lowest satisfaction ratings. Satisfaction with the ease of interaction, amount of light, and layout were rated highest.

### Aspects of Like and Dislike

These findings were also reflected in the results of the analysis of the qualitative data (fig. 2). We found that social aspects, like the ease of communication, interaction and collaboration with colleagues as well as positive qualities of colleagues were most often referred to as positive aspects of the workplace, whereas environmental factors were most often cited as negative aspects of the workplace, with thermal and acoustic discomfort as well as matters of cleanliness leading the way. The following quotes from participants further illustrate these points:

“At least I like my office mates as the lighting is poor, we get lots of street noise if we open the windows, my desk is too small for my work with very limited storage space and the room is filled with random crap.”

“I go in because it is good to interact with people. I like working at home but it can get a bit insular.”

### Use of Third Places for Work

Participants indicated that some of these parameters also influenced their use or avoidance of their workplace. Nearly two thirds of participants stated that they used other places for work on campus (fig. 3). Among these so called third places libraries were mentioned most often followed by cafés and common rooms as well as workshop and lab spaces (fig. 4).

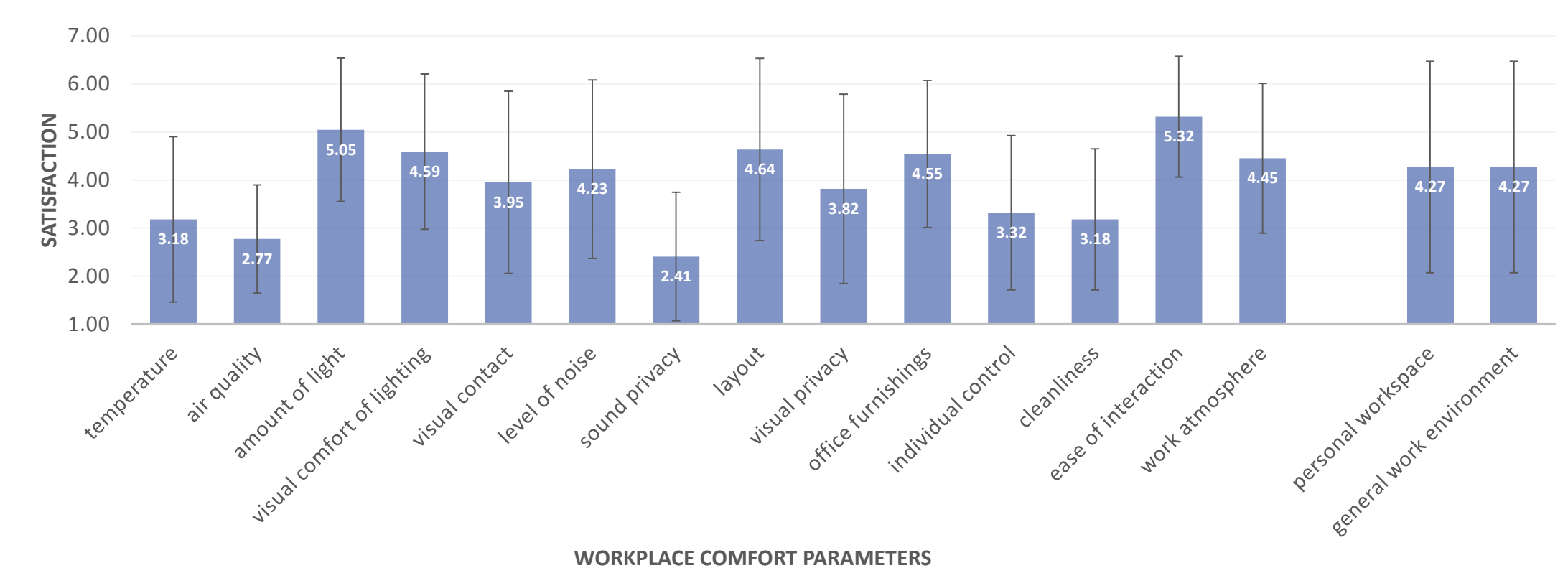


Figure 1: Average Occupant Satisfaction in Regard to Different Comfort Parameters

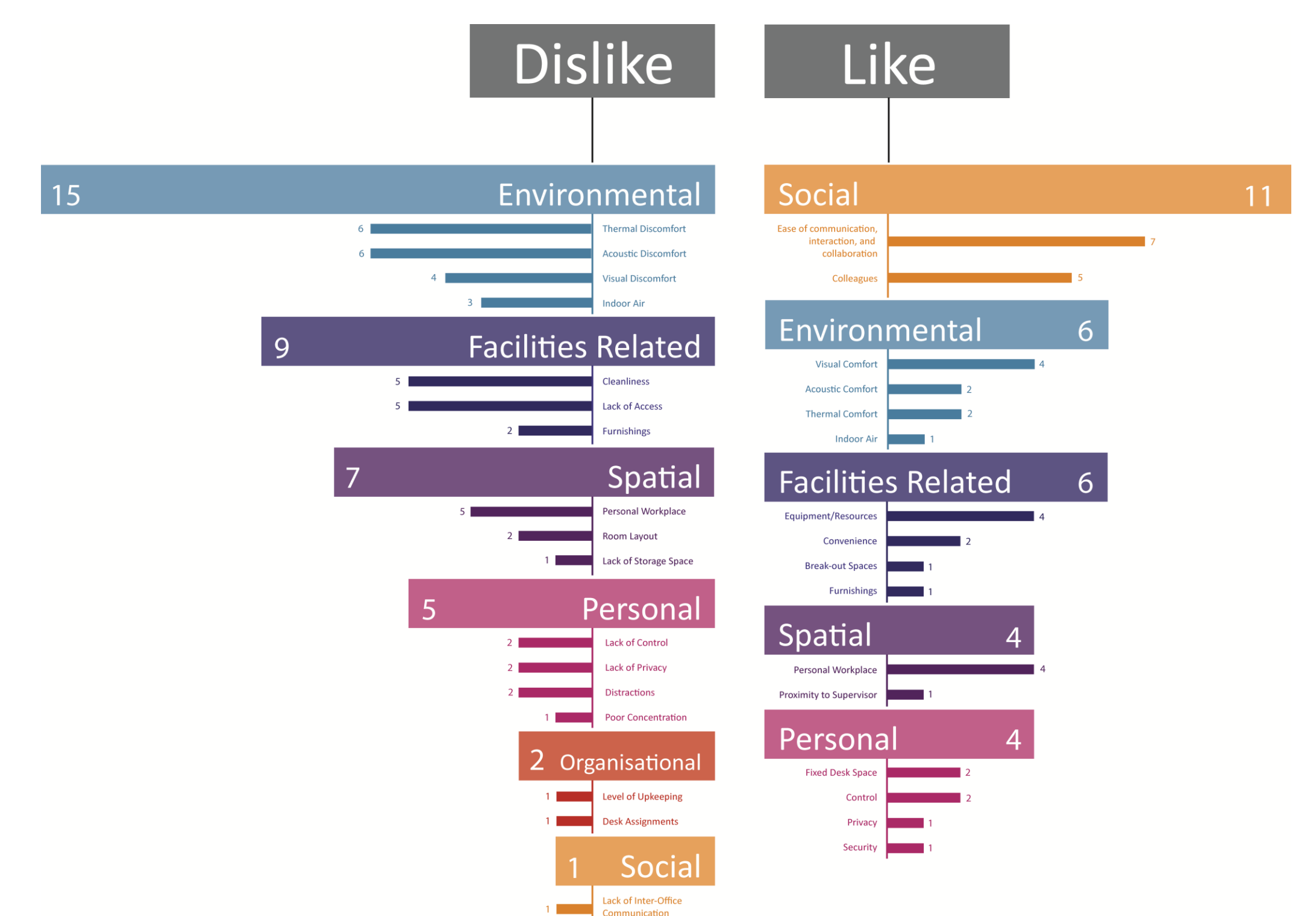


Figure 2: Workplace aspects liked and disliked by participants and frequency of their mention

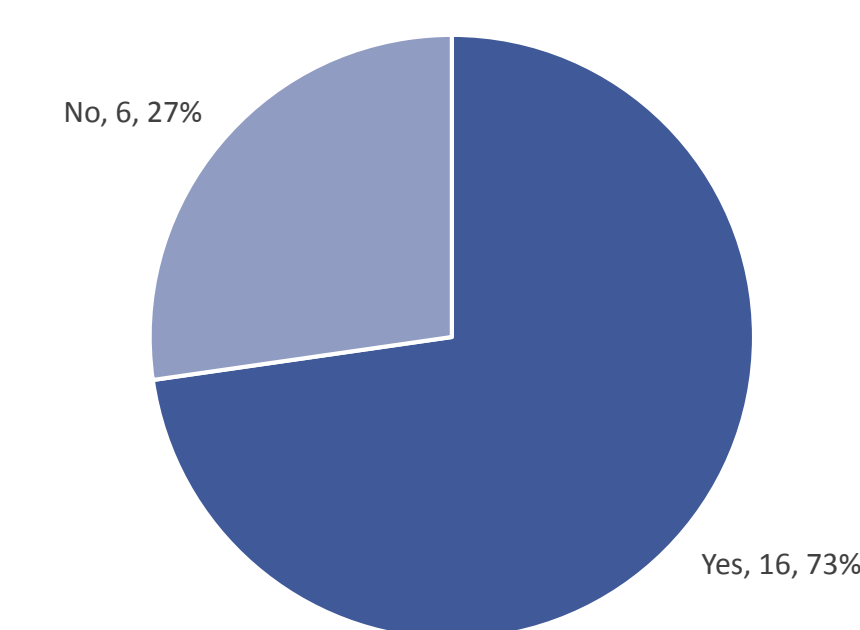


Figure 3: Are there any other spaces at Queen Mary that you use for work?

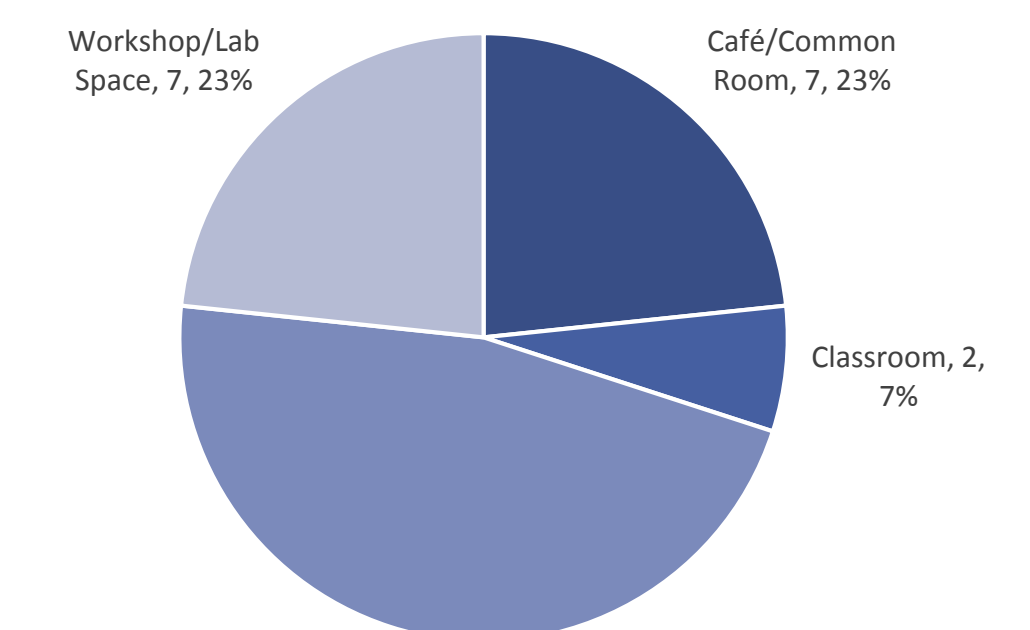


Figure 4: Third Places used for work

## Discussion and Further Work

Based on the finding that nearly three thirds of participants indicated that they use other places to work, we identified decision making processes based on indoor environmental quality parameters taking place in the choice of a work place as one possible area for further investigation, which could include looking at activity and work patterns alongside individual preferences.

Furthermore, we found that the standard deviation of answers in regard to the satisfaction with different parameters over the whole sample population as well as regarded for different subsets of samples proved to be quite high. This suggests that answers spread and in turn satisfaction varies widely supposedly due to different

environmental and spatial aspects participants encounter, as well as due to other aspects, such as the frequency of use, individual personal characteristics and experiences, which constitutes another direction for further investigations.

In the scope of subsequent research we chose to further explore the latter. Based on the findings presented above we have been taking a closer look at environmental and spatial conditions and workplaces of individual occupants to be able to better evaluate and understand exiting problems, user satisfaction and perceived comfort. In addition, further work includes looking at possibilities to help overcome discomfort, in particular thermal discomfort, on a micro-environmental level by introducing personal environmental control devices.

## References

Center for the Built Environment UCB. (n.d.) *Center for the Built Environment: Occupant Indoor Environmental Quality (IEQ) Survey*. [Online]. Available from: <http://www.cbe.berkeley.edu/research/survey.htm>. [Accessed: 31st August 2014].

Leaman, A. and Bordass, B. (2005) Productivity in buildings: the “killer” variables - part 2. *EcoLibrium*. (May), p.22–29.

Vischer, J.C. (2008) Towards an Environmental Psychology of Workspace: How People are Affected by Environments for Work. *Architectural Science Review*, 51(2), p. 97–108.

Vischer, J.C. and Wifi, M. (2015) The Effect of Workplace Design on Quality of Life at Work. In Fleury-Bahi, G., Pol, E., and Navarro, O. (eds.). *Handbook of Environmental Psychology and Quality of Life Research*. London: Springer, 2015. [Online]. Available from: [http://media.wix.com/ugd/4f41d3\\_470799daaf0646adb86068824ee90935.pdf](http://media.wix.com/ugd/4f41d3_470799daaf0646adb86068824ee90935.pdf). [Accessed: 3rd August 2015].

## Acknowledgments

This work is supported by the Media & Arts Technology Programme, an EPSRC Doctoral Training Centre at Queen Mary University of London (EP/G03723X/1).