Desk ownership in the workplace: The effect of non-territorial working on employee workplace satisfaction, perceived productivity and health

Jungsoo Kim [a, *], Christhina Candido [a], Leena Thomas [b], Richard de Dear [a]

[a] Faculty of Architecture, Design and Planning, Wilkinson Building G04, The University of Sydney, NSW 2006, Australia
[b] Faculty of Design Architecture and Building, University of Technology, Sydney, NSW 2007, Australia

ARTICLE INFO

ABSTRACT

The concept of non-territorial workplace has been adopted by a growing number of organisations. It is clear that the main driver for desk sharing practices is the tangible economic benefits guaranteed by reducing the amount of office space per person. However, the question of whether or not occupant comfort or productivity are compromised in the pursuit of space efficiency has never been investigated. This paper draws on a database from Australian building occupant survey to investigate how desk arrangements (whether or not one has a pre-allocated desk) can affect occupant satisfaction, self-reported productivity or health at workplaces. Our statistical model indicates a fall in occupant self-assessed productivity as spatial factors (such as the office layout allowing easiness of interaction with colleagues, the ability to adjust/personalise workspace, and the amount of storage space provided) perform below occupant expectations. Analysis of the results also show that the association of spatial factors with occupants' self-assessed productivity (quantified by odds ratios) was more pronounced among those in non-territorial workplaces, compared to those who are assigned with a pre-allocated desk. With respect to self-assessed health, the comfort of furnishing was identified as the strongest predictor for shared-desk users. Our findings suggest that these spatial factors, rather than the desk ownership itself, play a more significant role in the non-territorial work arrangement, affecting occupant attitude towards their building.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

The cost associated with office accommodation (e.g. rent, heating or cooling, lighting, interior fitting, furniture, service, etc) can be substantial for many organisations. Typically, these property-associated costs are considered to be the second highest after employee salaries for most companies [1]. For example, office occupancy cost per workstation per annum was estimated at over US$20,000 in London and Hong Kong in 2013 [2]. Over the decades, the transformation of office work environments from cellular to open-plan offices has been driven by economic pressure in the management of property costs [3–5]. On average, office space (m²) allocated per workstation has declined nearly 50% over the last two decades [6]. Tangible economic benefits have made open-plan layout the dominant office type across the commercial property sector, although negative effects on comfort and work performance due to close proximity between occupants have been extensively debated in the literature across various research disciplines [7–13].

In more recent years, the pursuit of further office space efficiency has broken the link between workstation and employee through flexi-desking, which refers to workstations that are shared by more than one individual and typically claimed/booked on a daily/temporary basis. While an open-plan layout supports more people in the same amount of space by *reducing square metre per workstation*, the idea of flexi-desk (also termed hot desking, desk sharing, or non-territorial working) increases efficiency by *increasing the average number of employees per workstation*.

In the traditional model of an office-based organisation, a fixed workstation is allocated to each employee (i.e. people to workstation ratio of 1:1) based on the assumption that employees occupy their "own" desks throughout a working day. Under this scenario, it is observed that a significant proportion of workstations remain

* Corresponding author.
   E-mail address: jungsoo.kim@sydney.edu.au (J. Kim).

unused and therefore office space utilisation falls, simply because occupants are often absent from their workstations (e.g. annual leave, sick leave, attending training courses, and meetings outside the office) [14–16]. This problem is exacerbated where large areas are often dedicated to senior staff who are away from their office more frequently or as a consequence of organisations employing modern, non-standard working patterns (e.g. full time, part time, or job sharing) and location (e.g. home, client's place, or other external locations) [15,17]. The concept of non-territorial working has been widely adopted in corporate office settings as a solution to improve occupational space efficiency, through flexi desking or desk sharing.

In addition to direct cost savings from more intensive use of office space, as has been pursued in the public sector [18,19], flexi-desking arrangement can bring indirect benefits to an organisation by allowing the workplace to be more responsive to the rapid organisational change, such as expansion, downsizing, or change in team structures [20]. As workstations are depersonalised in the desk sharing environment, it becomes easier to re-locate staff members, in contrast to the conventional workplaces [15]. Flexi-desk work environment has the potential to improve teamwork. When properly designed, the layout generally affords more space for interaction and collaboration between co-workers and contributes to cross-departmental collaboration, as staff members are no longer confined to a designated location and are given ample opportunity to interact with colleagues [21]. It is also argued that the ability to choose work location generates a sense of autonomy and control over the work environment, which might result in greater work satisfaction [22]. Furthermore, non-territorial workplaces are believed by many to improve productivity as workers can choose the most appropriate setting (e.g., formal/informal meeting area, quiet study room, project/team room, cafeteria, break-out area, soft seating, etc.) for them to complete specific tasks. Such an office configuration has been often referred to as Activity Based Workspace (ABW) in corporate real estate for the last several years.

Notwithstanding the tangible economic advantages from maximising space efficiency, there are obstacles and issues of concern when implementing the concept of non-territorial working. First, significant day-to-day and long-term variations in the total number of employees attending at work [23] can make it difficult to predict the number of desks needed. This could lead to a loss of productivity if demand for workstations exceeds the number available. Second, under non-territorial working conditions in which all the work areas are shared and interchangeable, occupants tend to lose the ability to display their own identities and define the boundaries of their surroundings [21]. Limited ability to personalise one's workspace contributes to a low level of perceived privacy, which in turn can lead to employees' emotional exhaustion [24]. Third, a clear desk policy where shared-desk users are obligated to clear up a desk after each day of work, pack up and store their belongs in personal lockers is not easily enforced [19]. Fourth, there is potential productivity decrement as each employee loses time towards the daily process of finding and setting-up a workstation, and packing-up at the end of the day. Fifth, personal hygiene is also an area of concern because of the shared furniture, keyboard, and phones among multiple individuals. Finally, there could be cultural resistance to accept the new working style. Breaking the conventional "me and my desk" culture and withdrawing the ownership of a designated desk from employees is acknowledged as a barrier to the introduction of non-territorial workplace [25].

Notwithstanding the rapidly growing popularity of these non-territorial workspaces [21,26], there have been very few empirical studies examining the potential impact of non-territorial working environment on office users. Data currently available with regard to 'flexi-desking' are mostly found in reports or booklets prepared by

facilities management consultants, highlighting the projected cost savings when this concept is applied to an office building. Although one of the primary reasons why a growing number of organisations implement flexi-desking policy is to maximise space efficiency, it is important to remember that the underlying assumption is to do so *without* compromising individual's comfort and productivity [19]. However, it is indeed rare to find peer-reviewed research articles that investigated how flexi-desking policy driven by organisations are actually perceived or evaluated by the actual building users. In the commercial building sector, ensuring occupant comfort and providing excellent Indoor Environmental Quality (IEQ) are widely regarded as key performance targets of facilities management practice. The underlying logic is that IEQ has a significant impact on the occupants' comfort and productivity, while staff salaries account for the largest proportion of total expenses in the life cycle of a building [27,28]. Therefore it is important to investigate how workplace IEQ is perceived by the occupants in the office buildings in which the non-territorial working policy has been implemented, and in turn, whether or not their comfort and productivity are compromised by the pursuit of space efficiency.

This paper attempts to better understand how desk-sharing environments can affect the office workforce, in relation to their satisfaction with various IEQ factors. In addition, the paper addresses side effects of the non-territorial working policy, and examines the influence of this type of workplace on occupants' perceived productivity and health. Based on empirical data derived from both quantitative and qualitative analyses performed on an office building Post-Occupancy Evaluation (POE) survey database, the paper discusses occupants' attitudes and reactions towards various workplace issues, depending on whether or not they hold ownership of a pre-allocated workstation.

2. Methods

2.1. Occupant survey

The empirical analysis in this paper is based on an occupant survey database from BOSSA − Building Occupant Survey System Australia. BOSSA is an officially accredited POE system within the IEQ section of Australia's building sustainability rating schemes including National Australian Built Environment Rating System (NABERS) [29] and Green Star Performance [30]. BOSSA's online survey tool assesses the office building occupants' satisfaction levels for key IEQ related workplace issues such as spatial comfort, indoor air quality, thermal comfort, acoustics, visual comfort, and perceived productivity and health [31].

BOSSA's online survey is initiated upon the request from a client (e.g. building owners, tenants, or property management companies) and building occupants are invited to participate in the survey by following the web-link embedded in the recruitment email circulated to all-staff through the participating organisation. The survey typically takes 6−7 min for a participant to complete. Survey responses are digitally recorded and time-stamped. Background information about occupants and their workspaces, such as participants' demographics, type of work they're engaged, time spent at workspace, workspace layout, and workstation arrangement, is collected at the beginning of the online survey. During this process, respondents were asked to indicate whether or not they were assigned with a pre-allocated workstation (i.e. *fixed* OR *no-fixed*). Simultaneously, basic information about the surveyed building such as location, size, HVAC (heating, ventilating and air-conditioning) systems, materials, design features, sustainability ratings is collected from the building owner or the facilities management team. Depending on the availability, floor plans of the surveyed building are collected in order to better understand the