MATCHING ACADEMIC WORKSPACES AND WORK CHARACTERISTICS

ABSTRACT

The work role of university academics in Australia has undergone widespread changes since the 1980s, however academic workspaces remain relatively unchanged. This paper investigates academics' satisfaction with workspace provision to discover if traditional enclosed offices best support the current nature of academic work.

A survey of 210 academics provided data to determine where they undertook tasks and to calculate the satisfaction with distractions and interactions in academic workspaces. On the whole, these academics were satisfied neither with the level of distractions nor with the support for interactions within their own workspace.

In comparison with the commercial sector, which offers fewer alternative work locations and a higher portion of non-private workspaces than in the academic sector, academics took advantage of the opportunity to undertake tasks off-campus that required concentration and few distractions.

Keywords**:** academic work, workspace satisfaction, distraction and interaction, post occupancy evaluation

INTRODUCTION

The role of the workplace is to support work. Since the 1980's, advances in technology and communications, increases in professional specialisation and the need for businesses to 'future-proof' in uncertain times have all contributed to large changes in the way people in the knowledge sector work. The design of commercial workplaces has responded with increased use of open plan layouts, mobility and new space management processes to support workers in their new work roles and as a response to increasing costs of space (Mawson 2002a). In Australia the work role of university academics has also been affected by widespread changes brought about by new technologies, funding structures, responsibilities and increased accountability measures (Anderson et al 2002, Coaldrake and Stedman 1999, McInnis 1998). Despite significant changes to the academic work role, the majority of academic workspaces remain virtually the same.

Previous research of workspace design has identified the two most important functions of the workspace as the ability to support distraction-free work and workplace interactions (Roper and Juneja 2008, Meerwarth et al 2008, Brill and Weidemann 2001). Although studies in workspace design have established the need for workspaces to provide both privacy for distraction-free work and support collegiate interactions, there has yet to be this type of analysis on academic workers. This study is the first of its kind, drawing together knowledge about academic work roles with knowledge about workspace design to support distraction-free and interactive work.

This research investigates, through online questionnaires of academics in the Melbourne area, (Australia) their:

- Satisfaction with the level of support for distraction-free work provided by their own workspace

- Satisfaction with the support for interactions provided by their workspace

- The locations in which they choose to undertake their work tasks.

The results of this study are compared to existing research findings in commercial workplaces of satisfaction and productivity studies. Where the research in commercial workspaces has been rigorous and plentiful, there have been only a limited number of studies of Australian academics and academic workspaces. The existing research on academic satisfaction in Australia is centred on their work role and contextual working

conditions, not the physical space in which they work (Anderson et al 2002, McInnis 1998). This research combines knowledge from commercial workspace studies with academic work satisfaction studies to complete a study of academic workspace satisfaction.

KNOWLEDGE WORK, SATISFACTION AND PRODUCTIVITY

The background to this research into the workspace satisfaction of academics is grounded in the body of research concerning knowledge worker satisfaction, and how the workspace influences this.

People who work with information and the generation of new knowledge were first termed 'knowledge workers' by Peter Drucker in the 1950s. These people are seen to be motivated by the job itself, its challenges and learning opportunities (Drucker 1998). Whilst academics are considered knowledge workers (Davies 2009), to date there has been much more research into the productivity and satisfaction of non-academic knowledge workers. This concern with worker satisfaction has been shown to be important to the financial performance and success of organisations, since knowledge worker satisfaction is linked to productivity (Haynes 2007b, Davies 2005, Mawson 2002a, b, c; Roelofsen 2002; Thompson 2008).

Different types of knowledge worker will utilise their own workspace differently, depending on their work role. Brill and Weidemann's (2001) study showed managers spend the least time in 'quiet work', which was made up for by an increase in interactive work within their own workspace, and in meetings and other activities outside of their own workspace. Engineers and technical staff spent the greatest portion of their work time in distraction-free work in their own workspace, and the least in interactive activities. There has been comparison of workplace design satisfaction between academics and commercial workers, which proved the groups to be significantly different (Langston et al 2008). Whilst the Brill and Weidemann (2001) study allows insight into how a workspace may be utilised for distraction-free and interactive tasks, and the different requirements of the different roles, a comparative study for academic workers would provide a better understanding of academic work in the broader context of knowledge work.

Support for Distraction-Free Work

Supporting distraction-free work is one of the two most important workspace qualities impacting worker performance and satisfaction (Roper and Juneja 2008, Meerwarth et al 2008, Haynes 2007c, Brill and Weidemann 2001). Private workspaces, enclosed offices with full height walls which provide acoustic and visual privacy, best support distraction-free work (Meerwarth et al 2008, Davies 2005, Brill and Weidemann 2001). The impact of distractions on knowledge workers is especially hard to define – the loss of one great idea is literally immeasurable (Spira and Feintuch 2005; Wilkinson and Leifer 2003). However, not all work which people do requires intense concentration and the dual role of the workspace is to support both the need to do distraction-free work while also supporting interactions and collaborative work.

The original rationale of moving employees from private enclosed offices to open plan in the 1970s and 80s was to increase positive workplace interactions and knowledge sharing, while reducing the overall office space requirements and thus overhead expenses of providing office space (Marquardt et al 2002). Even a small office allocation can be overcome with adequate partitioning for visual and acoustic privacy (Brill & Weidemann 2001). Knowledge worker productivity research has now made clear that even a small increase in worker productivity is worth significant real estate expense (Haynes 2007b).

The move to open plan has contributed to complaints from workers about the high level of distractions and interruptions suffered in an open plan workspace (Heerwagen et al 2006, Davies 2005, Marquardt et al 2002). Designers and facility managers of office spaces are now revisiting workplace design for knowledge workers to meet both competing requirements for privacy to do distraction-free work, and the need to support interactions in the workplace (Mawson 2002a, b, c).

Non-private offices, that is, open plan or shared offices, can be a source of distraction for workers (Roper and Juneja 2008, Davies 2005, Brill & Weidemann 2001). While distractions can be overcome by increasing the effort of concentration, extended periods of increased effort is linked to increased worker stress. Under stress, workers can experience psychological, emotional or behavioural reactions (Sutherland and Cooper 2006), including but not limited to: ill health, forced early retirement, absenteeism due to sickness or lack of motivation, poor performance and productivity, unsatisfactory workplace relationships and lack of self-esteem.

Some proponents of open offices determine that there can be better sharing of knowledge between workers if they can overhear each others' conversations. Brill and Weidemann's (2001) study however show there is little benefit of overhearing others conversations from one's own workspace:

> "In general, most people don't learn much (from overhearing), and people in the open learn no more from overhearing others' conversations than do those in private offices." (Brill & Weidemann 2001)

Workspace partitioning provides occupants with visual and acoustic privacy and, in the case of enclosed offices, physical boundaries with which workers can control some elements of their work environment (Roper and Juneja 2008). Any partition with less than full height walls cannot provide complete acoustic isolation, and many types of office doors and walls also allow noise leakage from adjacent spaces. Commercial workers report higher levels of workspace satisfaction when some opportunity to influence or control their environment is in place, closing the door to their private office being a key example of control (Brill & Weidemann 2001).

Roper and Juneja (2008) undertook an extensive review of literature regarding distractions in the workplace, covering research published from 1958 onwards. In their review the work requirements of concentration and collaboration are compared to the support provided by open plan workspaces. The results show that productivity, satisfaction and performance of knowledge workers is compromised by open office design where workers find themselves often distracted, and less likely to have good relationships with colleagues who, due to lack of privacy and separation, are largely a source of distraction.

Support for Interactions

Supporting interactions with co-workers is one of the two most important workspace qualities impacting worker performance and satisfaction (Roper and Juneja 2008, Meerwarth et al 2008, Brill and Weidemann 2001). Office layout and workspace provision has been linked to the development of collegiate social networks, levels of informal interaction, information sharing and other behavioural impacts (Heerwagen et al 2004). Serrato (2003) found that a low level of visibility into workspaces and the layout of workspaces in a maze-like pattern reduced the number of spontaneous interactions for research scientists. Becker and Sims (2001) found that workspaces with low partitions provided an environment which supported four to six times more frequent interactions than private offices or high partitioned workspaces. However, these often informal interactions (commercial knowledge workers spend between 19-35% of their total work time talking in or near their own workspace, according to Brill and Weidemann (2001)), means that this is the amount of time which their work may be distracting people nearby from their own work.

The importance of support for interactions for academic work is less well documented than for commercial workers but does exist (Limburg 2007, Lacy and Sheehan 1997). In Limburg's (2007) study of discourse in an academic office, it was found that the complex academic matters which are discussed informally between the academic and students in the office setting have important pedagogical consequences. Interactions between faculty members are also of vital importance and workspaces should not impede the development of a sense of community, intellectual atmosphere, and faculty morale, all the greatest predictors of academic job satisfaction (Lacy and Sheehan 1997).

The importance of interactions is clear, and increased amounts of interactions can be provided in highly visible workspaces, however the quality of the interaction is also important, which may be why workers with private offices report higher satisfaction with workplace communication and interaction than those in non-private workspaces (Brill & Weidemann 2001).

THE ACADEMIC WORK ROLE: TASKS AND LOCATIONS

Academics as knowledge workers undertake a broad range of activities both within their workspace and in a number of other locations both at their workplace and off-campus. Workspace design for academics requires a considered approach so that differences in their work roles, task configurations and social-interaction requirements can be catered for in their workspace design. Meerwarth et al 2008 considered that even commercial research workers "…have architectural and special work requirements (that) are necessary for sustaining, as well as enhancing, their ability to complete their work tasks effectively".

Like commercial knowledge workers, it is important to provide workspaces for academics which support distraction-free work and interactive work (Davies 2009). Davies (2009) studied the link between academic job satisfaction and their office environment to find that academics perceived the largest impediment to their

productivity as excess noise, interruptions and a lack of privacy, and a lack of thermal comfort. Davies (2009) sample size was too small for statistical relevance, but the findings for academic workers were in line with those found for commercial knowledge workers (Roper and Juneja 2008, Heerwagen et al 2006, Brill and Weidemann 2001) and should be tested for a larger sample group to confirm these links.

Work Tasks

An academic's career prospects are largely determined by their research success (McInnis 1999) and writing research grant applications and publications requires privacy, freedom from interruption and concentrated attention. McInnis (1999) surveyed 2,609 academics on their work role and found academics ranked their commitment to work tasks as follows: 87% were committed to research activity followed closely by postgraduate thesis supervision (82%), publication of research findings (81%) and undergraduate teaching (81%). Academics in this sample group showed the least commitment to committee work (29%) and administrative work (25%).

In terms of the time available to academics to achieve these research outcomes that are critical to the success of their career, McInnis (1999) reports that academic workers typically spend just 20-25% of their time on research activities and more than 50% of their time on teaching, and interactive tasks.

A reliable measure of the amount of time academics spend between the functions of teaching, research, administration and other duties is hard to come by due to the difficulties of capturing an irregular work load, flexible work arrangements, and the high level of professional autonomy which academics enjoy (McInnis 1999, Anderson et al 2002). However there have been some general data produced on average work hours, and the general distribution of this time (McInnis 1999).

Work Locations

During the semester, academics undertake a wide range of teaching, research, administration and other tasks in their office, classrooms, laboratories and other specialist teaching spaces. Academics have the freedom not just to pursue their own goals but also to choose, to a certain extent, where they do their work. With access to personal computers and the internet, many academics can even choose to work from home. To date there has been no data collection on the portion of the academic work day spent in different work locations.

Given the varied nature of the work tasks undertaken by academics, there is a need to provide spaces that can accommodate these tasks:

> "When the physical environment lacks features considered essential, those affected either adapt to or change their environment to make it more useable or desirable…" (Meerwarth et al 2008).

Research by van der Voordt (2004) into the costs and benefits of workspaces where people do not have a dedicated office space and/or workstation, lists potential costs to the organisation as including the loss of productivity due to lack of concentration, excessive noise, privacy, territory and identity. Whilst the link between workspace provision and academic satisfaction has not been tested, it seems intuitively obvious that similar considerations would apply.

This research offers some insights into levels of academic workers' satisfaction with the level of support for distraction-free work provided by their own workspace, satisfaction with the support for interactions provided by their workspace and the locations in which they choose to undertake their work tasks and comparison is made with the commercial sector research results.

METHOD

This research collects self-reported levels of privacy and distraction and participant reports of academic workspace privacy design features. The questionnaire results can then be compared to existing knowledge about workspace design developed by the commercial sector (Bodin Danielsson and Bodin 2008, Meerwarth et al 2008, Haynes 2007a, Brennan et al 2002, Brill & Weidemann 2001). The structure of the questionnaire is based on commercial workplace satisfaction surveys to enable the results to be compared to previous studies in workspace design. The questionnaire includes a job analysis profile tailored specifically to suit academic work which allows these results to be compared with existing knowledge about academic job satisfaction.

The questionnaire gave respondents options of describing where they undertook their work – with the workSPACE defined as their desk and immediate surrounds, and their workPLACE as the larger area in which their workspace is situated – and could include library, café spaces, meeting rooms etc. Table 1 breaks down the options for work roles and chosen locations within the questionnaire and the potential for interaction or distraction-free work.

Table 1 Academic work tasks by work category, location options, type, collaboration and formality

	In the workspace	In the workplace or off-campus	Interactive	Distraction-free	Individual	With others in the room	Informal interaction	Planned meeting
Teaching								
Lecture and class preparation	●	●		●	●			
Lecturing and teaching classes	●	●	●			●		
Scheduled meetings with students	●	●	●			●		●
Student assignment marking	●	●		●	●			
Online teaching/lecturing	●	●		●	●			
Telephone work for teaching	●	●	●					
Research								
Research and academic writing	●	●		●	●			
Research activities in labs /studios		●						
Scheduled meetings for research	●	●	●			●		●
Telephone work for research	●	●	●					
Administration								
Scheduled meetings for administrative work	●	●	●			●		●
Administration tasks outside of meetings	●	●		●	●			
Telephone work for administrative tasks	●	●	●		●			
Informal activities								
Informal interactions	●	●	●			●	●	
Taking breaks	●	●		●	●			

Administration of the Questionnaire

The survey was anonymous and web based. Academics with an accurate and active email listing on their faculty website and working on a university campus in Melbourne received an email invitation to participate in the questionnaire, with a web link. Electronic surveys achieve a lower response rate than other types of surveys (Wolfer 2007), and when the survey closed, 210 useable responses had been received representing an estimated response rate of 10 per cent.

RESULTS

Of the 210 responses to the question determining University appointment, 80% of respondents were full time academics; 10% were Part-time academics; 4% were casual academics; 4% were non-academic with teaching or research responsibility; and 2% were administration staff.

Work Type & Location

Respondents reported working an average of 76.8 hours per week (unspecified teaching or non-teaching period). This is considerably higher than the findings of previous studies of Australian academics (McInnis reports academics working 45.4 hours in 1977, and 47.7 hours in 1993), and still higher than Enders and Teichler (1997) found Dutch professors to be working in 1996 (57 hours in teaching period). The questionnaire format may have contributed to this disparity since total work hours were calculated from adding together respondents answers to a number of individual questions, not their own estimate of how many hours they typically work in a week as a total. It is possible that the feeling towards the type of work done distorts perceptions of the number of hours spent on it, as McInnis (1998) reports that 45% of academics felt their workload had undergone a substantial increase, when the total increase in hours over a 20 year period was almost entirely a 2 hour (4.8% total work time) per week increase in administration time. From this it is suggested that those tasks which one considers interference will feel as though they take more time than those to which one is committed. Academics in this study reported spending approximately 8.3 hours per week on administration (10.7% of total work time). For the purpose of this research it was more important to get the relative proportions of work time spent in each location, and the totals were less important.

The results of this research show that academic workers spend on average 65% of their total work time doing distraction-free tasks, (research tasks taking up 34% of the total work time), but less than half of this work is done in their own workspace (see Figure 1). In comparison with commercial knowledge worker studies, according to Brill and Weidemann (2001), engineers and technical workers spend approximately 63% of their total work time doing distraction-free work, all within their own workspace. So while academics may be spending a similar portion of their work time on distraction-free work, they are doing less of it in their own workspace. Figure 1 below shows the academic work type by location from this research, displayed next to the Brill and Weidemann (2001) findings for managers and engineers and technical workers. Comparatively, academics spend a much smaller portion of their work time in their own office (44%) and do more than half of their total distraction-free tasks outside of their own workspace (35%).

Academic workers in this study spent on average only 14% of their time in interactive activities in their own workspace. As reported by Brill and Weidemann (2001), managers spend 35% of their work time in or near their workspace engaged in interactive activities and 48% of their work time in their own workspace doing distraction-free work. In total, managers spend an average of 76% of their work time of their time in their own workspace. They spend the most time on interactive activities out of any of the knowledge worker groups.
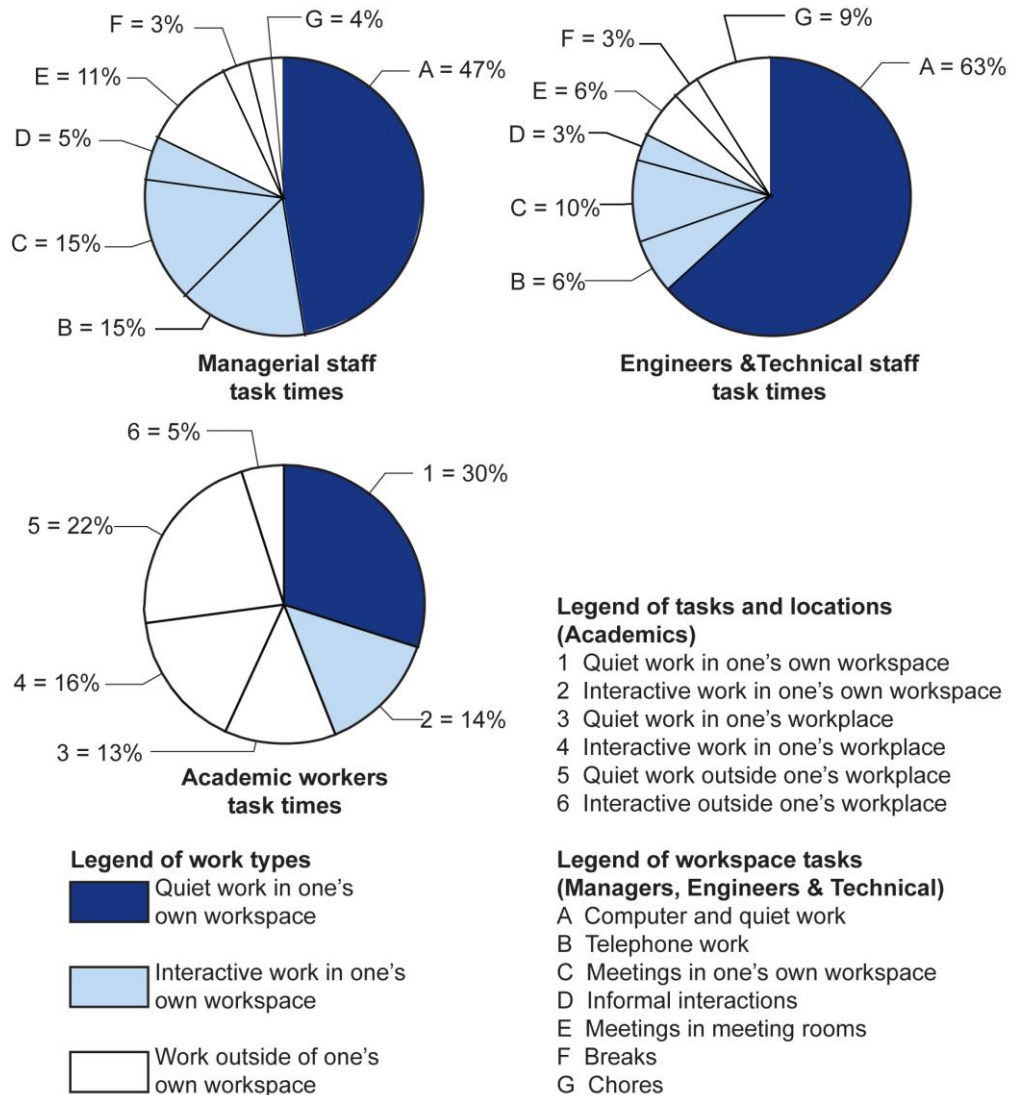
Figure 1 Knowledge workers time spent on distraction-free and interactive work and location choice

(Source: Managers and Engineers from Brill and Weidemann 2001 and Academics from this research)

Ranked Importance of Workspace Qualities

Academics placed less importance on the ability to do distraction-free work in their own workspace than commercial knowledge workers, and much less value on having support for interactions. Ranking of desirable workspace qualities by academics placed distraction-free work fifth on their list of eight given workspace qualities (quality lighting and access to daylight; temperature control and good air quality; workspace comfort and ergonomics; enough space for equipment and personal storage; access to necessary technology; located near co-workers; located near students; ability to do distraction free solo work; space for impromptu interactions; space for meetings and distraction free group work; access for people with disabilities). Distraction free work ranks as the most important quality for commercial knowledge workers (Brill and Weidemann 2001). The difference in these results may be explained by the different work times spent in work locations, academics doing more than half of their distraction-free work outside their own office may not need their office to support distraction-free work as much as commercial workers, who do all of their distraction-free work in their own office).

The comments from academics confirmed that they chose to undertake work requiring concentration outside of their workspace due to a variety of issues such as lack of acoustic privacy, lack of visual privacy with glass walled offices and the shortcomings of the overall workplace design to provide workers with essential

amenities such as adequate bathrooms. This finding contradicts the commercial work sector where an enclosed office provides the most satisfying workspace for distraction-free work and interactions (Brill and Weidemann 2001). Academics placed support for interactions in their workspace second-last of the eight workspace qualities listed, commercial knowledge workers placed this quality second (Brill and Weidemann 2001). Although the literature suggests that collaborative research and shared teaching is increasing in academia (Anderson et al 2002), workspace support for interactive work is not considered an important workspace quality in this academic sample group. No difference in the importance of workspace interactions was evident between disciplines in this study.

Academics in this study group were given the same list of workplace priorities that appeared in the Brill and Weidemann study, the comments the academics added were mostly to do with acoustic privacy (22% of total additional comments). From this, it seems that academics have different workspace priorities to commercial knowledge workers. The findings that academics in non-private offices feel significantly more supported than those in private offices for interactive work is congruent with findings of Serrato (2003) who found that increased visibility of scientists was linked to increased interactions in the workplace.

Satisfaction with Support for Distraction-Free Work & Interactions

This research found that provision of a private office is neither linked to increased satisfaction with distraction in one's own workspace, nor to increased satisfaction with workplace interactions. Academics in non-private offices scored significantly higher for satisfaction with the ability to do distraction-free work in their own workspace, and the mean score for satisfaction with the support for interactions was also higher (but no significance found). This result was contrary to the results for commercial knowledge workers and researchers, for whom a private workspace was found to best support both distraction-free work, and interactions in the workplace (Meerwarth et al 2008, Roper and Juneja 2008, Brill and Weidemann 2001). These findings provide support for Langston et al's (2008) conclusion that commercial workers and academics are significantly different in workplace design satisfaction factors.

The results for academics are markedly different from those reported for the commercial sector, where the provision of a private workspace is found to best support both a distraction-free workspace, and interactions in the workplace (Meerwarth et al 2008, Roper and Juneja 2008, Brill and Weidemann 2001). The reasons these academics respond differently to their commercial counterparts may include workload split - 56% of an academic's total work time is spent outside of their own workspace, whereas commercial workers spend just 22% outside of their workspace (Brill and Weidemann 2001). On average academics also do almost half of their total distraction-free work outside of their own workspace and they spend most interactive task time outside of their workspace.

In the commercial sector there appear to be fewer alternative work locations and a higher portion of non-private workspaces provided than in the academic sector. These two factors may explain why commercial workers rank 'the ability to do distraction-free work' in their own workspace as their highest priority (Brill and Weidemann 2001), and academics consistently rank daylight, good air quality, temperature control and ergonomic comfort above 'the ability to do distraction-free work' in their own workspace.

CONCLUSIONS

This research has investigated academics' satisfaction with workspace provision to discover if traditional enclosed offices continue to best support academic work, and compares these results with existing research in the commercial sector. A survey of 210 academics provided data. The results indicate that academics are not satisfied with the level of support for distraction-free work or interactions in their private workspace.

These results for workspace satisfaction are markedly different from the commercial sector, where the provision of a private workspace is found to best support both distraction-free work, and interactions in the workplace (Roper and Juneja 2008, Meerwarth et al 2008, Brill and Weidemann 2001). The reasons for these academics responding differently to their commercial counterparts include workload split - only 44% of an academic's work time is spent in their own workspace, whereas commercial workers spend approximately 78% (Brill and Weidemann 2001). Academic workers spend on average 65% of their total work time doing distraction-free tasks, (research tasks taking up 34% of the total work time), but less than half of this work is done in their own workspace.

In the commercial sector there appears to be less alternative work locations and a higher portion of non-private workspaces provided than in the academic sector. These two factors may explain why commercial

workers rank 'the ability to do distraction-free work' in their own workspace as their highest priority (Brill and Weidemann 2001), and this study found academics consistently rank daylight, good air quality, temperature control and ergonomic comfort above 'the ability to do distraction-free work' in their own workspace.

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