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ABSTRACT

In the early 1990s, a few organisations in the Netherlands began to experiment with flexible workplaces. Traditional cellular offices and the open-plan offices or team-oriented bullpen spaces in which everyone had their own fixed workplace were no longer a matter of course. Making use of modern information and communication technology, the pioneers redirected their attention towards the sharing of activity-related workplaces in a combi-office. Economic considerations (e.g. low occupancy of expensive workplaces), organisational developments (network organisations, teamwork, fast exchange of knowledge, part-time work) and external developments (globalisation, strong competition) are important drivers for change. The aim is to stimulate new ways of working (dynamic, less closely linked to place and time), to improve labour productivity and to make major cost savings (fewer workplaces, fewer square metres), without reducing employee satisfaction.

Since then a number of new offices have been realised. Twelve per cent of organisations that have moved recently use flexible workspaces for the most part or exclusively. An important question now is whether the aims have been achieved. What are the actual benefits? What are the risks? How should consultants advise their clients? The field is dominated by the opinions of those in favour and those against. Statements expressing the successes or failures of flexible offices contradict each other. Hard data are almost lacking. Due to the scarcity of empirically supported insights, the Delft University of Technology in the Netherlands together with the Centre for People and Buildings and the Centre for Facility Management are carrying out investigations into the costs and benefits of workplace innovation. This paper reports on progress so far, with a focus on employee satisfaction and labour productivity.

Keywords: new offices, flexible working, productivity, employee satisfaction, research, post-occupancy evaluation

EXPECTED AND ACTUAL EFFECTS OF FLEXIBLE WORKING

There are high expectations when it comes to workplace innovation. The expectation is that, by sharing different types of workplaces, each geared towards different kinds of activities, and the availability of advanced information and communication technology, ergonomic furniture and digital team archives, this will lead to a more efficient use of space and other facilities (input) and a better performance of the organisation and its employees (output). Aims that are often mentioned are:

- Increased effectiveness, ie higher productivity;
- More pleasure in working, ie greater employee satisfaction;
- A positive image of being a modern and professional organisation, internal (employees) and external (public opinion, clients), and as a consequence:
- Attraction and retention of scarce personnel and clients;
- More flexibility;
- Lower costs.

Organisations are primarily concerned with achieving a better performance at lower costs. For employees, a very important factor is gaining pleasure from their work. With respect to productivity, a common opinion is that an open structure (transparent dividing walls, or no cut-offs at all) encourages more communication and facilitates an easier exchange of knowledge and skills, whereas the availability of cockpits or concentration cells creates good conditions for concentrated work. With respect to employee satisfaction, a common belief is that giving up one's personal desk conflicts with basic human needs for privacy, territoriality, personalisation and expressing one's status, but that this can be compensated by nice architecture and interior design and high-tech gadgets. A probable resistance to change will be counterbalanced by organisational advantages such as reduced facility costs and increased flexibility, which make it easier to cope with growth (or downsizing) and staff turnover.

From a social point of view, the expectation is that flexible working will contribute towards sustainability. Space savings will reduce requirements for energy and building materials. Remote working at a distance from the core office may reduce the mobility of the working population, thereby reducing the number of traffic jams.

The question now is whether workplace innovation meets these expectations. Is this office style really more efficient and agreeable? Or do the expansive openness and the constant changing of workplace act against productivity? Can the extra costs of attractive designs, individually adjustable furniture, high-tech ICT and image-enhancing gadgets be matched by the expected returns in the form of higher productivity and a more efficient use of space? There are countless interesting opinions and reflections;[1] but present opinions should be taken as hypotheses that need to be proved in practice. Satisfaction with the attractive design and layout of innovative offices, and improved communication, have to be set against complaints that it is difficult to work in a concentrated way. Improved effectiveness has to be set against loss of status, privacy and territory. Cost savings through sharing workplaces have to be set against cost increases from expensive ICT and the extra attention needed for its implementation and maintenance. Whether the outcome of the balance between the benefits and costs will be positive or negative cannot be predicted beforehand. This makes it awkward for property and facility managers to give well-founded support to decisions about whether or not to change over to flexible working.

NEED FOR CLEAR RELATIONSHIPS

Not only are the findings contradictory and the 'hard' data about the effects incomplete; we are also confronted by an unclear framework of concepts and a lack of clear, unambiguous methods to put them into operation. What exactly is meant by 'costs' and 'benefits', or by the 'performance' of organisations and employees? Aims are seldom put into operation in measurable terms. There is also insufficient knowledge about the relations between the accommodation and an organisation's performance and the interactions with intermediary variables such as organisational characteristics or the nature of the work. An increase or

decrease in productivity following the introduction of flexible workplaces does not mean, by definition, that flexible working is the cause of these changes.

According to Clements-Croome,[2] productivity depends on four clusters of variables: personal characteristics, such as the phase in someone's career, profession, or skills; social factors, such as relationships with colleagues; organisational characteristics, such as the organisational structure or management style; and characteristics of the physical environment, such as the indoor climate (temperature, lighting and acoustics), air quality (humidity, draughts and pollution) and workplace layout. The external environment will have an effect as well: for instance, the employment market; rules made by governments and by private concerns; and globalisation. So the effect of accommodation interventions on organisations, work processes and company performance is determined by many sorts of complex relations between different 'subsystems'.

Much research is needed to unravel cause–effect relationships and the relation between the aims and the means applied. For this reason, the Centre for People and Buildings in Delft, Netherlands, has set up a review of relevant literature, case studies, interviews and workshops with experts and end users to close the gaps in our present knowledge.[3] In this paper we discuss the effects on employee satisfaction and labour productivity of flexible working in offices with activity-related and shared workplaces. We discuss both of these concepts, how to measure them, and what lessons have been learned so far.

PRODUCTIVITY

The dictionary defines 'productivity' as the state of producing rewards or results. 'Productive' means fruitful, lucrative and profitable. In this context, productivity is synonymous with output. In scientific literature, 'productivity' is defined as the relationship between output and input; between results or proceeds and sacrifices.[4] When it concerns the ratio between the total output and total input (all labour and capital), economists refer to 'total factor productivity'.[5] If it involves the ratio between output and a specific part of the input, this is referred to as 'partial productivity': for example, labour productivity expressed as the amount

of production for each labour unit, or the number of labour hours for each product unit. Output involves the number of products, the quality of the products and the operating result, expressed as, for example, net profit or market share. Input involves all company resources that are used: labour (number of employees, number of full-time equivalents), capital, technology, information (training, education), facilities and services, including property and facility services. There are three ways to increase productivity:

- Increase output with the same input (improved effectiveness).
- Achieve the same output with less input (improved efficiency).
- Achieve a relatively stronger rate of increase in output compared with the increase in input (both more effective and more efficient).

Measurement methods

In some areas of commerce, it is relatively simple to measure productivity. Good examples are the car industry (eg the number of man hours per vehicle), or a translation bureau (the number of translated words per employee per day). But productivity is much more troublesome to measure in knowledge-producing organisations. How great is the productivity of — for instance — a manager or a policy assistant? A review of literature on real estate, facility management, business administration and environmental psychology shows that, in these disciplines, productivity and the difference in productivity among working environments are measured in five main ways:

- *Actual labour productivity*: for example, the number of phone calls per employee and per unit of time (call centre), or the number of completed policies per month, per employee or per division (insurance company).
- *Perceived productivity*: for example, by asking people to assign a report mark to the environment indicating the extent to which it supports their productivity, or asking them to rate their appreciation using a three or five-point scale. Variants include: What percentage of your time is spent working productively? What percentage of

your time is spent working unproductively because of distraction? What percentage of your time is spent searching for a suitable workplace? By what percentage would your productivity increase if working conditions were to change?

- *Amount of time spent*: for example, the amount of time gained because filing is carried out more efficiently or because staff turnover can be dealt with more easily (rooms no longer have to be cleared out); or the amount of time lost by having to log on more frequently and to clear desks on a regular basis.
- *Absenteeism due to illness* (a form of non-productivity).
- *Indirect indicators*. To what extent can people concentrate properly, or are they actually distracted? How quickly can employees solve a problem or supplement a lack of knowledge through interaction with colleagues?

Most of the time, comparison of data on productivity in a new office versus a more traditional one does not occur at individual level but at an aggregated level, by comparing group averages. If the composition of the research group has altered, it can be tricky determining whether any changes have been caused by the office concept or the different structure of the group. This is an argument for measurement at individual level. Although perceived productivity probably provides a reasonable indicator of the actual productivity, and particularly of the qualitative effect (positive or negative) of the examined variable on the output of an individual, the reliability and validity of this measurement method is questionable. On the one hand, socially desirable answers are highly likely: nobody likes stating that he or she is unproductive. On the other hand, we most probably do not measure productivity so much as satisfaction. It is likely that people who are satisfied with a particular concept are more inclined to view the effect on their productivity in a positive light, while dissatisfied people may be more inclined to regard the effect as negative. So although data on perceived productivity have their value, we should also pay attention to other indicators mentioned above.

Data on productivity in new offices

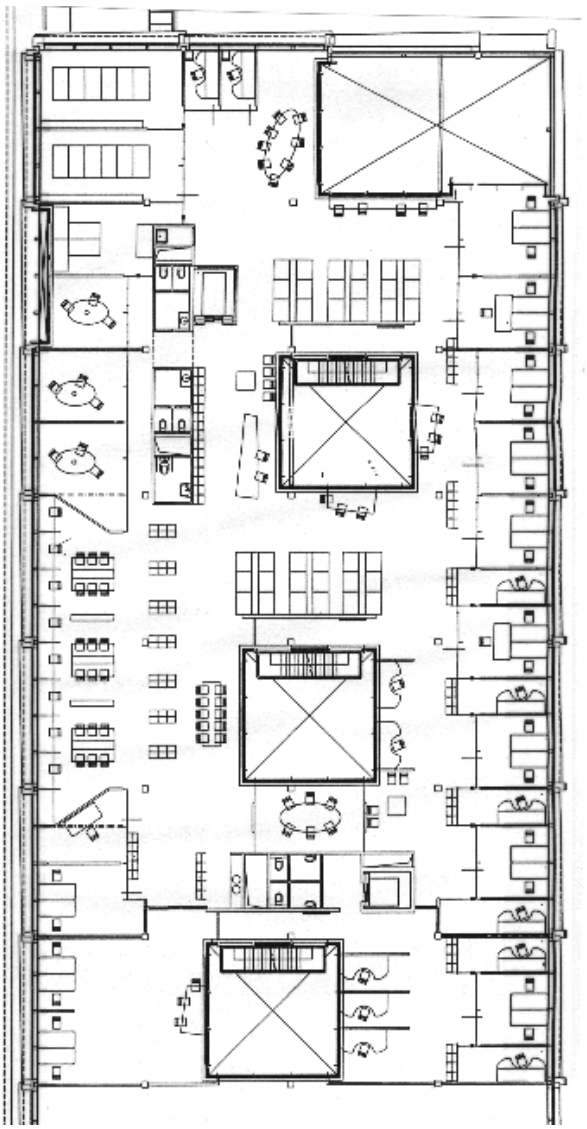
As yet there are only a few research results available on the effects of innovative workplace design on productivity. We will discuss two Dutch cases: the Dynamischkantoor Haarlem, and the regional office of the ABN AMRO Bank in Breda.

Dynamischkantoor Haarlem provides accommodation for six sections of the Ministry of Housing, Spatial Planning and the Environment. On the initiative of the Department of Public Buildings, a combi office was chosen, with flexible, activity-related workplaces; a central archive with trolleys for personal files; and a high level of openness, with much glass (Figure 1). A comprehensive survey revealed that the new building has not yet met the high expectations.[6] Communication has improved and the facilities are viewed with satisfaction, but it is difficult to concentrate while working. Compared with the previous set-up (mainly cellular offices), perceived productivity dropped by a full point, from 7.5 to 6.5 (Table 1). A second follow-up measurement revealed a slight recovery (to 6.8). Older employees respond somewhat more negatively than younger ones (6.3, compared with 6.9). The proportion that thinks the working environment is conducive to individual productivity decreased from 60 per cent to 25 per cent. The second follow-up measurement revealed that this percentage has also slightly improved, to 28 per cent; this is perhaps due to a degree of habituation. It is also notable that newcomers are generally more positive than experienced employees. When people join the organisation, they apparently consider the environment as a fact. For experienced employees, the high expectations have not been entirely met.[7]

Table 1: Perceived productivity in Dynamischkantoor Haarlem

Occasion of Measurement	*Perception of Productivity*	*Judgements*		*Number of Respondents*
		Positive	*Negative*	
		%	%	
Baseline	P = 7.5	60	14	142
First follow-up	P = 6.5	25	37	147
Second follow-up	P = 6.9	28	30	152

Figure 1 Floorplan of DynamischKantoor Haarlem



In the *Regional Office of the ABN AMRO Bank* in Breda (Figure 2), by contrast, an increase in perceived productivity was measured.[8] In the nil measurement (temporary accommodation in an open-plan office) only 14 per cent of the employees thought that the working environment had a positive influence on productivity. After flexible working had been introduced, this percentage rose to 51 per cent (Figure 3). The percentage who viewed it negatively dropped from 27 to 8 per cent. Positive points were seen to include the ability to move to a place reserved for concentrated work, where there were fewer distractions than before (eg colleagues walking past or telephone conversations); and the more efficient creation of archives.

The different effects of a more or less similar concept can be partly explained by the different initial situations: for example, an open-plan office as opposed to office units; and whether or not employees were originally working at the same location.

Figure 2 New floorplan of the regional office of ABN AMRO Bank

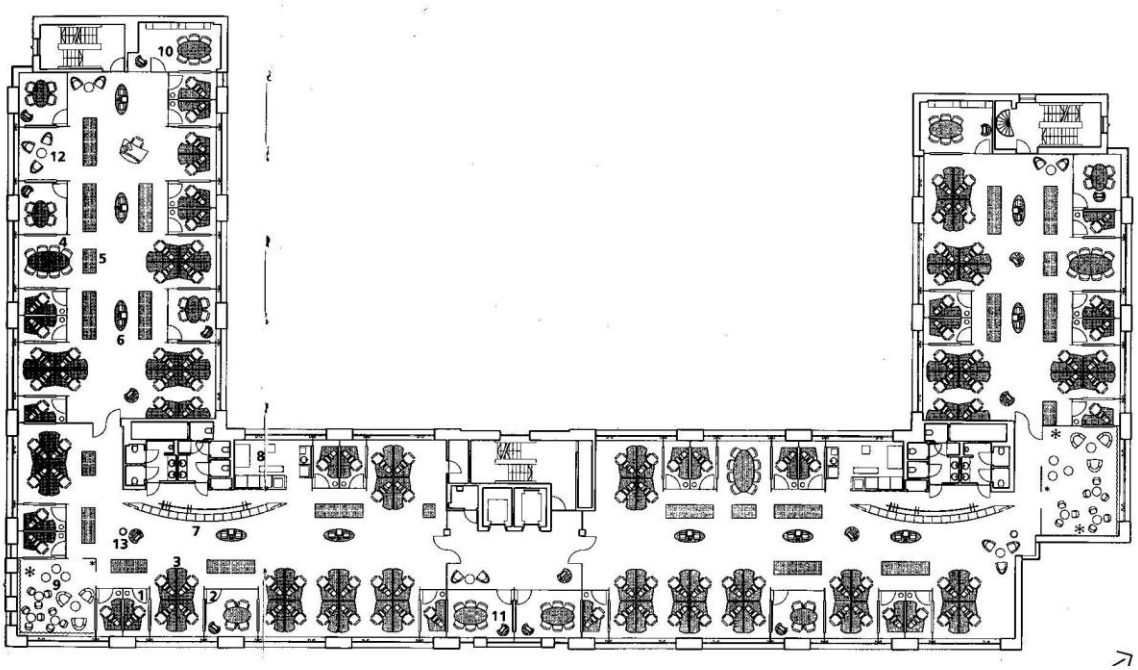
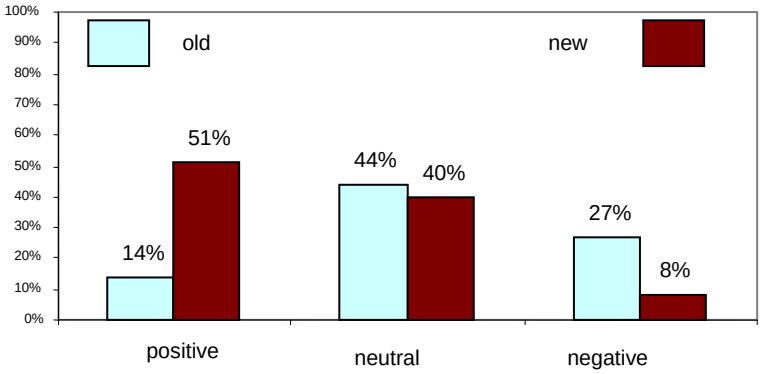


Figure 3 Perceived productivity in regional office of ABN AMRO Bank



Another factor may be the way in which the concept has been put into practice: for instance, the number of workplaces allotted per 100 employees; the number of square metres used for each workplace; and the quality of the noise insulation in the concentrated work units. When we couple the results from these two case studies and a few others with experts' reactions in workshops, an overview emerges, as shown in Table 2.

EMPLOYEE SATISFACTION

Employee satisfaction refers to the degree to which the working environment meets the wishes and the needs of the employees. It can relate to the work itself (content, complexity, required knowledge and skills, degree of autonomy); the social working environment (colleagues, management style, conditions of employment such as salary, leave arrangement, and career prospects); the physical working environment (workplace, lighting, daylight, view etc); and interactions between these aspects. Aspects that are not work-related, such as the employee's private life, can also play a role. In measuring changes in employee satisfaction resulting from workplace innovation, therefore, we must be thorough in taking into account the possible influence of many other factors. Because of the wide scope of satisfaction, it is extremely important to determine beforehand what the parties concerned want to know and what they want to do with the acquired knowledge.

Table 2: Positive and negative effects of workplace innovation on productivity

	Positive	*Negative*
Organisation	Transparent organisational structure	Poor match between new working environment and organisation's structure and culture
	Adequate steering (open, more output-oriented)	Poor control on being present
Work process	Free choice of appropriate workplace (communication and concentration)	More time spent on organising work
	Culture change: work more consciously; make more goal-oriented choices; no more 'In the past we always did it this way'	Loss of time used for installation (logging on time and again; adjusting furniture; tidying up items)
	Stimulus to work in an organised way (clean desk; plan work in advance; professional filing)	Acclimatising time and again (different workplace; varying colleagues next to you)
	No space for saving things, so you have to finish them	More time required to look up and store information
Communication	Better information exchange Easier transfer of knowledge	Communication problems Too much communication
	Improved telephonic and physical accessibility	Personnel difficult to locate and/or difficult to reach
Concentration	Quieter working environment; fewer disruptions by colleagues in concentration workplaces	Loss of concentration caused by colleagues (passing by; visiting; phone calls) Noise hinders concentration

Facilities	Efficient helpdesk	Facility glitches (printer, laptop, copier)
	Professional laptops and other facilities	Not enough facilities → delays
	Extensive desk layout	Not all facilities within reach
	Greater user flexibility; less inconvenience during staff turnover	
	More efficient use of available resources	Lugging things around
	Faster decision making, thanks to e-mail	Inability to cope with central and digital filing system
General perception	Freedom to choose type of workplace	
	Greater freedom → higher satisfaction → increased productivity	Opposition caused by lack of privacy, territorialism, personalisation and status
	Motivational environment	
	New élan	

Relevant issues may be:

- the extent to which the working environment as a whole fits with daily activities;
- the functionality and appeal of various types of workplaces;
- the extent to which the environment stimulates communication;
- the extent to which personnel can concentrate in their working environment;
- the extent to which the environment fits with psychological needs such as privacy, territoriality, identity, personalisation and expression of status;
- accessibility of people (physically, by phone, digitally);

- flexibility and adaptability of the environment;
- services such as reception, repro, catering, mail delivery, helpdesk;
- indoor climate (temperature, light, sound, view, daylight);
- ICT facilities;
- furniture;
- filing (filing method, amount of filing space, accessibility, etc).

Measurement methods

There are roughly five ways of measuring satisfaction with workplace innovation. In different wordings, what is asked for is:

- *Satisfaction with specific aspects*: often on a five-point scale. For example, 'How do you value the following aspects (privacy of conversation, desk sharing, the size of your workplace, etc.): (very) unsatisfied → (very) satisfied; (very) bad → (very) good?'
- *The extent to which users think* these aspects are important: likewise mostly on a five-point scale, ranging from very unimportant to very important.
- *Overall assessment*: for example, 'What is your overall assessment of your physical working environment, expressed on a graded scale?' or 'What is your general impression of the new work environment: positive, neutral or negative?'
- *The most positive and the most negative characteristics* of the work environment: for example, 'Which three characteristics of your environment have had the greatest positive/negative influence on your work?'
- *Comparison with the original situation*: for example, 'Would you rather return to the original situation?'

Data on employee satisfaction with new offices

The effects of the introduction of flexible working on job satisfaction provide a mixed picture. In various projects, the majority of people are generally positive about the new concept, but there are also projects where the majority would prefer to revert to the old situation (Table 3).

Table 3: Percentage of people who wish to return to their former situation

Project	*Wish to Return*	*No Wish to Return*
Project 1	17	83
Project 2	24	76
Project 3	32	59
Project 4:		
Total	41	54
Department 1	57	33
Department 2	27	68
Project 5:		
Total	41	53
People having a fixed workplace	36	50
People having a flexible workplace	43	54
Project 6:		
First follow-up measurement	38	52
Second follow-up measurement	43	35
Project 7	78	22

Critical factors in the *process* are: an enthusiastic initiator, evident objectives, a sound balance between top-down and bottom-up (user participation), a transparent project organisation with clear-cut tasks and competencies of various actors, serious consideration of any user resistance and proper follow-up care.[9] A sufficient amount of time must be

reserved for notifying, assisting and training employees and for managing change processes.[10] At the same time, processes must not last too long, in view of the costs involved and the fact that people may drop out. Expectations must not be too high, and personnel must be made aware that final implementation may not be in full accordance with the proposals stemming from user participation.

Critical factors in the *product* are: the functionality and perception value of the workplace and other facilities; and the extent to which a balance is found between efficient and effective working and the fulfilment of all kinds of psychological needs. We will discuss the main results by focusing on four items: space allocation, psychological implications, the effects of openness, and the valuation of design and ICT.

Planning and Allocation of Flexible Workplaces

A poor relationship between the number of employees and the number of workplaces is viewed in an extremely negative light. Flexible working is superfluous if there are too many workplaces, but a shortage causes much irritation and forces personnel to use locations that are less suitable (for example, concentrated work in an open-plan office) or to work somewhere else, such as at home. Inability always to have immediate access to a flexible workplace may be regarded somewhat laconically by one employee while another may make an issue of it. In some projects, concentration cells are either never or rarely used for the intended purpose. Some are used as storage spaces or smoking rooms. It is very important that workplaces are allocated properly. Personnel whose jobs have very little in common are sometimes seated together. This is particularly unpleasant when jobs that involve a high and a low degree of concentration or communication are grouped together.

Psychological Effects of Flexible Working

A typical feature of flexible workplace solutions is that personnel work here and there, irrespective of time and place. This provides some with a positive feeling of freedom, while others find the constant need to switch a burden. Desk sharing is at odds with the need for personalisation and an individual territory. Users often try to claim a familiar place by arriving at work earlier, or by leaving items behind during their absence. The same (flexible) workplace for everyone provides fewer opportunities to express one's status. Some employees are fairly laconic, while others make an issue of it.[11] The principle of 'clean desk' makes personalising one's desk difficult or downright impossible. Although personnel are able to deal with this properly in the long run, it is a negative point.[12]

The effect of flexible working on social interaction is mixed. The ability to choose one's desk is generally appreciated. Besides dynamics, it also provides people with the opportunity to establish new contacts. As a result, they can become better acquainted with less familiar colleagues and acquire new knowledge and experience: a significant point that is scored from an individual perspective, as well as for 'learning' organisations. At the same time, close contact between colleagues who sit close to each other and work well together may be unintentionally disrupted.

One of the few readily available publications, on the evaluation of the Interpolis office in Tilburg,[13] reveals that autonomy at work and informal contacts have increased, while cooperation has improved. On the other hand, opportunities for formal contact have hardly changed. The same applies to opportunities for concentrated work and participation in decisionmaking. Work motivation has also decreased somewhat, but this has also been observed in a control group within a more traditional setting. The decrease in work motivation can therefore probably be attributed to other factors. There are now fewer complaints about noise, humidity and temperature. The 'person–office fit' (the extent to which the workplace is tailored to the personal needs and wishes of employees) is experienced in a far more positive manner than in the old situation.

The Perception of Working in an Open Environment

Working in an open, transparent office, without walls or with a lot of glass, is also perceived in different ways. An open environment offers more opportunities for communication and social interaction, but also generates many complaints about reduced privacy, both visual (seeing and being seen) and acoustic (hearing and being heard).[14] In open offices there are considerably more visual and acoustic stimuli than in enclosed, cellular offices. This mental burden raises stress levels in some people while the additional stimuli actually appeal to others, but noise pollution generally leads to a loss in concentration. The corridor is often an additional source of irritation when an open area also connects two or more other areas.

An example is the innovative office of the Dutch National Police Services in Driebergen. Users quickly screened off the corridor with cabinets and other furniture. As a result, this concept was partially boarded up. Because of the limited furnishing budget, it appeared impossible to implement the same range of furniture everywhere, so the untidy appearance was intensified even further.[15] In a discussion about five small-scale experiments with a combi office, a cloister office and desk sharing, common complaints concerned a lack of privacy and too much distraction.[16] Personnel were generally positive about communication and the opportunity to withdraw to a concentration cell, but negative about visual and acoustic privacy.

Valuation of Design, Furniture and ICT

In numerous innovative projects the building design is viewed in a favourable light, as are the layout and functionality of modern furniture and high-tech ICT. Large desks, comfortable chairs and an attractive and stylish layout contribute significantly to a positive valuation.[17] However, ergonomic furniture is not always used as intended. People find it bothersome and time-consuming to adjust furniture again and again, and not everyone knows how to do so. Lockers that are too small and trolleys or flexi-cases for personal files that are too heavy are often a source of irritation. Many people dislike having to log on (and off) to PCs and telephones, clear the desk and lug files around. Technical malfunctions and an inefficient

helpdesk can be extremely detrimental to an office concept that is actually good. Problem-free ICT appears to be a crucial factor for flexible working. Shortly after completion in particular, there are usually grievances about a network that is not flexible enough; compatibility problems arising from the application of various types of hardware and software; dissimilar user options (a fully equipped computer is installed at a fixed desk or flexible workplace, but not in concentration cells and team areas); time-consuming log-on procedures; and technical faults. Beyond the office concept, computers themselves can have a positive or negative effect on employee satisfaction. Computers allow people to work faster and with greater ease, but computers that crash and personal inability to use new programs will cause frustration, referred to as technology-related anger (TRA). Repetitive strain injury (RSI) is another danger, causing chronic problems in the locomotor apparatus in the neck, shoulders, arms, wrists and/or fingers. According to the Dutch ergonomist Peter Voskamp, between 26 and 55 per cent of monitor users in the Netherlands suffer from RSI.[18] Primary causes are a static posture with respect to the upper body, repetitive movement of wrists and fingers and a high workload. More than a quarter of employees suffer from back complaints.

REFLECTIONS AND CONCLUSIONS

The data on new offices show strong similarities to the results of studies in open-plan offices during the 1970s and 1980s. Many studies have identified complaints about the lack of privacy and the fact that employees are unable personally to control climate and lighting settings. Even when objective measurements revealed that the background noise of conversations in the buildings was not unduly loud (roughly 50 dB), it did distract employees.[19] It appears that high-level employees in particular are more negative about open-plan offices.[20] This underlines the fact that complex tasks require more peace and privacy. The greater need for status in the case of management may also play a role.[21]

Although the statement ‘a satisfied worker is a productive worker’ is not by definition true (people may very well be satisfied without being very productive!), the two variables are closely linked. In a perception study recently carried out at a health-insurance company that

used both cellular and open-plan offices, complaints about the lack of privacy during conversations corresponded significantly to perceived productivity. People who were accommodated in an open-plan office complained much more about this lack of privacy and rated their perceived productivity a full point lower (6.5 versus 7.7) than those working in cellular and group offices.[22] Although there were many complaints about visual privacy, too, these did not appear to correspond significantly to perceived productivity. Concentration, distance from colleagues, privacy, building-related health, workplace dimensions, image and adaptability all correlated significantly with the perceived effect of the office environment on employee productivity.

From Brill et al.'s research among 13,000 office employees in three different settings — a single office room, a double office room and an open office — the following ten most important influencing factors on productivity emerge:[23]

- The possibility of working individually without being distracted
- Spatial conditions favourable to spontaneous interaction
- Ditto for gatherings and undisturbed group work
- Workplace comfort, ergonomics and enough space to put things
- Suitable conditions for working 'side-by-side' and having a chat from time to time
- Staff are close to colleagues, or colleagues are easy to find
- Good pause areas
- Access to technology
- High-quality lighting and daylight
- Temperature and air-quality control.

This list confirms the great importance of convenient areas where information can be communicated and where concentrated work can be carried out as well. One of the main reasons for using combi offices, with a mix of shared and activity-related workspaces, has been to overcome the disadvantages of office units (too closed, poor conditions for social

interaction) and open-plan offices (too open, too many distractions). Experience to date shows that this objective is reached to a certain level; however, much attention must still be paid to reducing the number of complaints about distraction and lack of privacy. Subdivision of large open spaces into smaller, team-oriented compartments, noise-reducing measures and the allocation of concentration cells for long and confidential phone calls may help to reduce this problem.

Some of the less attractive aspects of flexible working are apparently relatively easy to counterbalance. This applies, for instance, to the loss of status arising from the absence of distinction between large, luxurious offices and simple, standard ones. A great deal of distress can be avoided by providing good fringe benefits and tertiary conditions of employment, including high-quality facilities and an attractively designed and comfortably furnished working environment. The need for personalisation of the workplace can be partly fulfilled in the case of flexible working by allowing employees to select a personal screensaver. The lack of a personal territory and personalisation opportunities can be partially offset by applying these principles to an organisational unit as a whole: that is, by giving a department its own identity by means of a colour and personal or collective attributes, thereby creating the feeling of a 'group territory'.[24] In that case, there is a shift from a personal to a group identity.

Our study has also shown that aims and expectations about effects of new offices are mostly more implicit than explicit. We would therefore recommend developing a consistent, complete, clearly classified and unambiguously formulated framework for *possible* objectives. This sort of framework can help those involved to set priorities and to make rational choices when discussing their own objectives. Unambiguous terminology will make it easier to compare projects, and thereby also the results of the measurements of effects. The Balanced Score Card could perhaps be put to good use here.[25] In view of the large differences in methods of measuring, our recommendation would be to develop a display chart for standard measuring methods. This would help organisations to make a reasoned choice, dependent on the objectives of their workplace innovation; the aim of the

measurements (a quick scan, or a well-thought-out integral evaluation, or one directed towards aspects of specific parts); the measurement period (beforehand, afterwards, over a longer period); the time available; the expertise; and the financial and personal means.

Finally, in spite of the insights acquired, many questions remain. The differences in satisfaction and productivity cannot always be satisfactorily explained. The extent to which differences in employees' perceptions can be explained by the characteristics of the people involved (sex, age, educational background), their position (place in the hierarchy, type of work) and their previous work situations (e.g. accustomed to working in an office unit or an open-plan office) is unclear. There is a need not only for more theorisation, but also for more empirical research. Because there are many variables to be considered that fall within the knowledge domain of various disciplines, our recommendation is that future evaluative research should be set up within a more interdisciplinary framework.

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