Student-lead evaluation of a new workplace concept in an academic environment

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Purpose – This paper presents the outcome of a student-lead evaluation of a new workplace concept in the staff room of the Academy of Hotel and Facility Management at the NHTV – a medium-sized school for higher vocational education – in the city of Breda, the Netherlands. The workplace concept, known as "NHTV@Work", was centrally developed by the Facilities Division of the said school, with assistance from professional workplace consultants. Outcomes of the current study will be used to improve the overall concept for implementation across all workplace environments of the NHTV.

Design/methodology/approach – The evaluation of this pilot project was considered a suitable project assignment for 2nd-year FM students of the theme "Corporate Real Estate Management". As part of the theoretical component of this theme, students were given instruction on diverse methodologies and approaches to workplace performance evaluation through questionnaires, observations and interviews. Through the application of a process-model for supporting decision-making on organisational accommodation as conceptual framework, the various methodologies were structured to provide students an optimal learning experience.

Findings – Outcomes of the research amongst a total of 91 members of staff affiliated to the Sibeliuslaan Staff Room identified (i) staff members using the workplace concept to be overall satisfied with the new concept, but less satisfied with the implementation and continued monitoring thereof, (ii) the use of the workplaces to be overall well-adopted, but a need for increased diversity in the functionality of specific types of workplaces provided, and (iii) a perceived misalignment of interest between the development and the new workplace concept by the Facilities Division and external consultants on the one hand, and the perceived work culture and functional requirements of staff members.

Originality/value - The study provides a comprehensive framework for firstly, assessing all workplace environments where the NHTV@Work concept has been implemented, and secondly, for inter-organisational comparative research and continues monitoring of the effectiveness of the workplace concept. In addition to this, the approach as applied in the current research, provides a qualitative project-based learning experience for FM-students of the Academy. The current research will add to lessons learned from previous evaluations of the Archimedesstraat pilot of the NHTV@Work concept.

Keywords – Workplace, NHTV@Work, satisfaction, performance, decision-making

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1. INTRODUCTION

In 2011 the Facilities Division of the NHTV Breda University of Applied Sciences, The Netherlands, launched a new workplace concept known as "NHTV@Work". The underlying intention with this new workplace concept – which is based on the principles of New Ways of Working, or NWoW (Dutch: Het Nieuwe Werken; Bijl, 2007; Egmond, 2010; Houtkamp, 2010) – is to ensure that both accommodation (real estate) and ICT are used efficiently, and that these resources are sufficiently flexible to accommodate possible future changes within the organisation without the need for further adaptation or investment in the work environment. In doing so, NHTV@Work has the following key objectives:

- To create an enjoyable and comfortable work environment for all NHTV employees and students
- To optimize the opportunities for communication and knowledge exchange
- To improve productivity through the efficient allocation of spatial, technological and HR resources
- To address issues of social behaviour to support and enhance the overall concept.

1.1 The SIB-pilot

To investigate the effectiveness of this workplace concept, pilot projects have been executed at two locations: the Archimedesstraat (2011) and the Sibeliuslaan or SIB (2013). Since the Archimedesstraat-pilot has already been evaluated (Hospitality Design, 2012), the focus of the current research was the first evaluation of the SIB-pilot between October and mid-December 2013. Outcomes of this research is expected to provide insight into the functioning of the pilot work environment, how it is being experienced by staff members and what their level of (dis)satisfaction with the new work environment is. In addition to this, the outcomes will also be used to fine-tune the NHTV@Work concept in general.

2. RESEARCH QUESTION AND SETUP

Apart from the research objectives discussed above, the research also formed part of the vocational education of the 2nd-year "Corporate Real Estate Management" theme. As such, the evaluation doubled as an educational experience by addressing the following specific learning goals of the theme:

- Analysing and positioning a complex problem
- Analysing a company and assessing its accommodation / real estate objectives
- Applying professional research methods, models and techniques
- Understanding the role of real estate as an asset in the corporate strategy
- Formulating an advice with the necessary recommendations for improving of the current situation

The theoretical component of this theme provided students with information on diverse methodologies and approaches to workplace performance evaluation through questionnaires, observations and interviews. Through the application of the Accommodation-Choice Model – a process-model for supporting decision-making on organisational accommodation – as conceptual framework, the various methodologies were structured to provide students an optimal learning experience (Voordt, et al. 2012; Ikiz-Koppejen, 2009).

2.1 Research question

In kicking off the project, students performed an indicative level POE of the workplace environment by means of a walkthrough of the SIB Staff Room (Preiser and Schramm, 2002). This initial observation of the workplace environment helped students to visualise and better understand the layout, and to better contextualise the following primary research question:

> ***"What is the level of satisfaction of SIB staff members regarding the current work environment and the thereby provided experience?"***

To support the main research question, the following secondary research questions were defined:

- Can the recent adjustments be described as improvements?
- Are the staff members satisfied with the physical environment?
- What kind of effect does the physical environment have on the behaviour of staff members?
- What are the recommendations for improving the guiding principles of the overall workplace concept?

2.2 Methodological framework

The theoretical component of this methodological framework included the following:
- Information on the BPE (Building Performance Evaluation) Process Model
- Information on the POE (Post-Occupancy Evaluation) Process Model
- Information on the AC-Model

2.2.1 BPE Process Model

One of the primary concerns in of the current research setup was to help students to understand the concept of post-occupancy evaluation (POE) of workplace environments, and the position thereof within the larger context of overall building performance evaluation (BPE). The BPE Process model (Figure 1) by Preiser and Schramm (2002) clearly indicates the role of POE in assessing the extent to which the built environment – in this case, workplace environments – meet the needs and requirements of users. In order to facilitate an informed discussion of the outcomes of this research in terms of the match between building and users, terminology developed by ASTM International (ASTM Standards for Whole Building Functionality and Serviceability, 2009) were introduced. These terms are:
- *Functionality* – "the level of requirements of the users for the functional capability of a building or building-related facility" (ASTM, 2009)
- *Serviceability* – "the level of functional capability provided by an existing building or building-related facility" (ASTM, 2009).

In terms of the primary research question, outcomes of the current research must provide a conclusive indication of the extent to which the serviceability of the SIB Staff Room meets the level of functionality imposed by users.
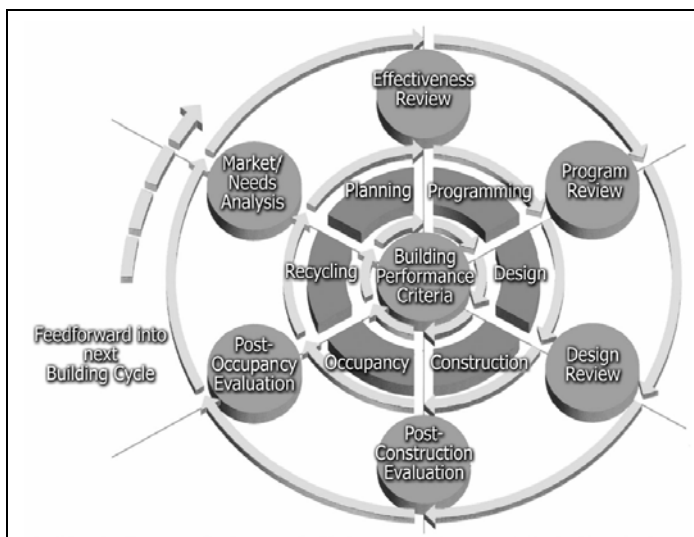

Figure 1: Process model for understanding the position of post-occupancy evaluation (POE) in the overall performance of buildings (Preiser and Schramm, 2002).
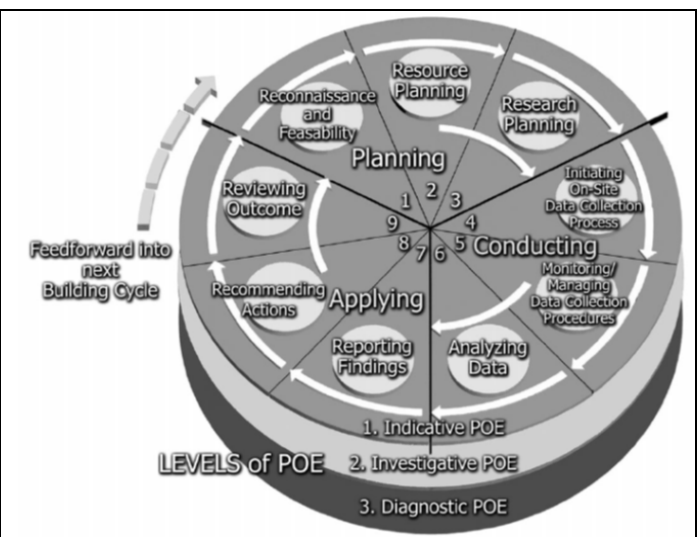
Figure 2: The three levels of effort associated with POE (Preiser and Schramm, 2002).

2.2.2 POE Process Model

Once the role of POE in assessing overall building performance was established, students were provided a more in-depth understanding of the concept of POE itself. For this purpose, the POE Process Model (Figure 2) by Preiser and Schramm (2002) was used to illustrate the different levels of POE-effort, and the different process steps involved in planning and conducting the evaluation, and applying the outcomes. In executing the evaluation of the SIB-version of the NHTV@Work concept, students moved through the three levels of POE-effort by starting at the indicative-level for obtaining insight and awareness regarding the SIB Staff Room, before moving on to the investigative level for conducting their actual research (questionnaire, observation and interviews). Finally, students entered the diagnostic level of POE where the outcomes of their investigative-level research were assimilated into recommendations for fine-tuning the NHTV@Work concept in general.

2.3 Conceptual process framework

2.3.1 AC-Model

The overall research process followed the process steps of the Accommodation-Choice Model (AC-Model) as discussed by Voordt et al. (2012). With this process model for evidence-based decision-making on organisation-specific accommodation as conceptual process framework for this research, the following process steps were identified:

- Step 1 – Defining the motivation for starting this project / Defining the research question to be answered and the and plan op approach:
  - (at the indicative-level POE effort).
- Step 2 – Analysing and understanding the current situation:
  - To enable a proper understanding of the context in which the NHTV@Work concept has been developed, and implemented in the SIB Staff Room, an analysis of the current situation is deemed necessary
  - (at the investigative-level POE effort).
- Step 3 – Defining the organisational goals and ambitions:
  - To understand the process of decision-making regarding the new workplace concept, the organisational goals and ambitions for and with the NHTV@Work concept need to be identified
  - (at the investigative-level POE effort).
- Step 4 – Making conceptual choices:
  - In order to meet the objectives of this research, conclusions drawn from the outcomes of this research, need to be translated into purposeful recommendations for improving the overall principles of the NHTV@Work concept
  - (at the diagnostic-level POE effort).

3. RESEARCH PROCESS AND ANALYSIS

In the following section attention will be paid to understanding the current situation (2.2.3: Step 2 of the AC-Model), and defining the goals and ambitions for and with the NHTV@Work concept (2.2.3: Step 3 of the AC-Model).

3.1 Analysing the Current Situation

3.1.1 Organisational vision and mission

In terms of the provision of suitable accommodation for staff and students, the vision of the NHTV is to offer a dynamic work and educational environment. In addition to providing this environment, a critical precondition is that it must support a highly qualitative educational experience through which students are prepared for a constantly changing and increasingly dynamic labour market. The primary objective of the NHTV@Work concept is to address these critical preconditions through the proper facilitation of interaction, meeting, learning, cooperation, innovation and collaboration. In doing so, the concept must provide space for working, consultation and study. In achieving

these objectives, the organisational visions is that all stakeholders – both students and staff – should at all times be consulted and involved to make sure the desired working and learning environment is created. The mission of the NHTV is therefore to develop a working environment which can not only be realized, but also through which a close fit with the needs and requirements of all users is ensured.

3.1.2 *Organisational policy of cross-cultural understanding and internationalisation*
NHTV is characterised by its cross-cultural understanding. At the SIB the importance of this aspect is made tangible through an educational programme which is presented entirely in English. During the 2012 accreditation by the Dutch-Flemish Accreditation Board the Academy of Hotel and Facility Management at the SIB was awarded a special distinction for "internationalisation". These achievements actively contribute to the specific cultural identity of the SIB as being a constant strive towards transparency, curiosity, innovation, the ability to follow intuition and the skill to 'think outside the box'. The NHTV@Work concept focuses on these aspects and aim to translate them into behavioural patterns. Ultimately, the concept aims to facilitate and enhance these patters through greater flexibility, transparency and collaborative possibilities in the SIB Staff Room.

3.2 Organisational Goals and Ambitions
NHTV@Work is a strategic workplace concept in which the departments of Real Estate and Accommodation, HRM and ICT are involved. The main goal is to develop and realize a new workplace environment which helps NHTV to achieve its strategic objectives (Hospitality Design, 2013) in cooperation with employees and students. In order to realize this vision the concept has to meet the following goals and ambitions:

GOALS AND AMBITIONS OF THE NHTV@WORK CONCEPT	
Stimulating / Improving:	**Specific accommodation issues to be stimulated and/or facilitated:**
Labour productivity:	• Increase the overall productivity • Creating opportunities for concentrated work
Innovation power:	• The academies and supporting departments have mutual benefits and are interconnected vessels. • Sharing knowledge is power
Employee satisfaction:	• Increase overall employee satisfaction • Cooperating differently, facilitated by a properly supported work environment
Health & safety:	• Ergonomic workspaces (NPR 1813) • Ergonomic chairs (NEN 1824)
ICT:	• Responsible for fully operational workspaces and meeting spaces (also teaching facilities)
Efficiency:	• Changing the use of the workplaces. • Sharing the workplace • Information is always available
Flexibility:	• Sharing the workplace • Clean-desk
Sustainability:	• Social responsibility in selecting furniture • Less paper / digitalisation
Image & identity:	• Showcase for other users within NHTV • Modern work environment • We are accessible
Organisational culture:	• Gaining experience with different types of workstations and behaviour • Changing the behaviour of people • Output-based management

Table 1: Categorisation of organisational goals and ambitions for / with the NHTV@Work concept (Ikiz-Koppejan, 2009).

3.3 Conceptual Decision-making in Defining the NHTV@Work concept

NHTV@Work focuses specifically on work processes and the mobility of employees in the performance and accomplishment of their tasks. In designing and realising this SIB-version of the NHTV@Work concept, the following key conceptual decisions were taken based on the gals and ambitions as defined:

- Zoning – Clear distinction between 4 zones:
    - Silent area
    - Quiet area
    - Dynamic area
    - Formal meeting area
- Workspaces:
    - Standard (ARBO[2]) workspaces for use > 2 hours (working either standing up or sitting down)
    - Short-stay workspaces for use <2 hours (checking e-mail, etc.)
    - Lounge spaces
    - Informal meeting spaces
    - Formal meeting spaces
- Separate work area for secretarial / administrative purposes
- (Formal) meeting spaces:
    - On average 4 persons per meeting
    - Current supply of meeting spaces for 2, 6 and 12 persons considered sufficient
- Personal lockers:
    - Current supply of personal lockers is considered sufficient
    - Focus on the digitalisation of all documents
    - Change in user-behavioural required to adapt to the focus on digitalisation
- Printing:
    - 1 printer to be centrally positioned in the SIB Staff Room
- Sustainability:
    - All new furniture to meet the minimum requirements set by Agentschap NL.[3]

In addition to the abovementioned conceptual decisions, the following NHTV-wide principles were also applied (NHTV, 2012):

- Workspace ratio (staff):   0.7
- Workspace ratio (lecturers): $\leq$ 0.5
- Floor area / workspace: 5.5 m^2

According to the workplace utilization study performed by méét (2013) just before the start of the current research, the SIB location currently provides a total of 64 workplaces on both the ground and first floor. However, the work environment observed during this research focussed exclusively on the 48 workspaces in the SIB Staff Room (Area 1 in Figure 3 and 5), and not on the 16 workspaces in the Support Office (Area 2 in Figure 3 and 5). In studying the research outcomes of méét it was felt that references to the different types of workplaces could not be easily related to the types observed in the current research. In order to create a clearer understanding and identification of the different types of workplaces in the SIB Staff Room, the current research employed the classification by Van Meel .et al (2010). In Table 2 the different types of workplaces in the SIB Staff Room is explained in more detail according to this classification.

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[2] ARBO: http://www.arboportaal.nl/onderwerpen/arbowet--en--regelgeving/arbowet/arbowetgeving.html
[3] Agentschap NL: Former agency (2010 – 2013) of the Dutch Government Department of Economic Affairs focusing on amongst other issues, the promotion of sustainability.
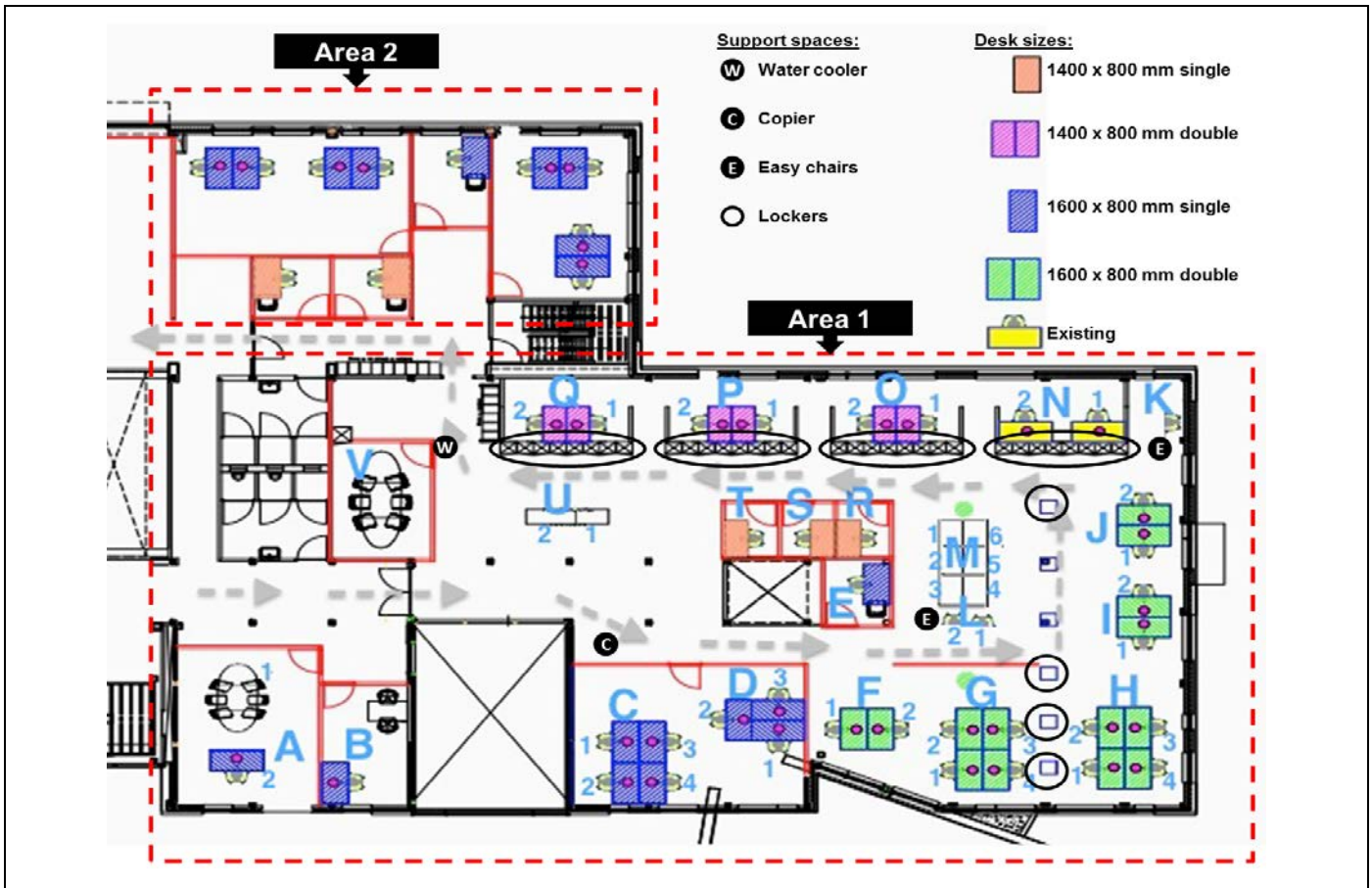
Figure 3: Layout of the 1st floor workplace environment at the SIB (see also Figure 4). The current research focussed exclusively on the workplace environment in the SIB Staff Room (Area 1).

CLASSIFICATION OF WORKPLACES IN THE SIB STAFF ROOM (AREA 1)		
1. Workspaces:	**# places**	**Ref. in Fig. 3**
- Individual workspace for management:	2	A & B
- Standard workspaces:	7	C & D
- Flex-workspaces:	14	F – J
- Short-stay workspaces:	6	M
- Quiet workspaces:	8	N – Q
- Concentration workspaces:	4	E, R – T
Total workspaces provided:	**41**	
2. Meeting spaces:	**# chairs**	**Ref. in Fig. 3**
- Meeting area in "A" (Fig. 3):	8	A1
- Informal meeting area "U" (Fig. 3):	4	U1
- Informal meeting area "U" (Fig. 3):	6	U2
- Formal meeting area "V" (Fig. 3):	7	V
Total chairs in meeting spaces:	**25**	
3. Support spaces:	**#**	**Ref. in Fig. 3**
- Lockers:	Existing	Fig. 2
- Easy chairs:	3	K, L
- Water cooler:	1	Fig 3.
- Copier:	1	Fig 3.

Table 2: Types and number of workspaces, meeting spaces and support spaces in the SIB Staff Room (Area 1) as observed during the current research.

According to the Programme of Requirements (NHTV, 2012) the SIB-location has to provide workspace to 73 employees (55.4 fte's) of which 56 employees (40.6 fte's) are specifically accommodated in the SIB Staff Room.

3.4 Protocol Development

The organisational goals and ambitions as stated in section 3.2 (Organisational Goals and Ambitions) were used in the development of protocols for the questionnaire, observation of the SIB Staff Room (Area 1) and interviews with selected members of staff.

3.4.1 Developing the questionnaire protocol

The questionnaire which was sent to the members of staff was a structured, non-disguised questionnaire (Balaji, 2009). This means that the purpose of the questionnaire was clearly communicated beforehand, and that the questions were structured in a specific order.

i) *Goals and ambitions for the questionnaires* – The goal of the questionnaire was to collect data on how satisfied employees are with the new workplace environment in the SIB Staff Room, and was considered a crucial component in the analysis of the staff room (Boynton & Greenhalgh, 2004). The questionnaire focused specifically on employee-perceptions of the physical environment of the SIB Staff Room, but also included questions about employee-behaviour and communication prior to the implementation of the NHTV@Work concept. Information collected through the questionnaires were used to identify key aspects for more in-depth investigation during both the observations (3.4.2) and the interviews (3.4.3).

ii) *Questionnaire development and testing* – Questions in the questionnaire were divided into closed questions (for collecting information on specific topics in order to compare between respondents), open questions to allow for individual meanings of responses, and opportunities to further explain answers to open questions. The questionnaire was developed by the research team in collaboration with Hospitality Design (HD), an external organisation with expertise in workplace research. The final questionnaire was adapted to the online questionnaire software used by HD, and e-mailed to all members of staff. Because of the limited time and resources, the questionnaire was not tested on a pilot group.

3.4.2 Developing the observation protocol

In addition to the questionnaire survey, a two-week observation of the workplace was deemed necessary. The main objective of the observation was to get a clear view on the use and occupation of all workspaces and meeting spaces in the SIB Staff Room, and to compare the outcomes to research conducted by méét (2013). The observation further aimed at obtaining insight into the social behaviour and work-related actions that occur most frequently in the workplace. During the observations the following information was documented:

- The exact time of the observation
- Whether a workspace is in use, reserved or vacant
- The kind of activity performed when it was in use (e.g. general desk work, conversation, etc.)
- The participants name if known (for internal use only. For external use this information is to be made anonymous)
- Other remarkable observations.

The observation walk was executed every two hours each day between 09:00 and 18:00 (Monday – Friday). Each time, the observations were done by two students from both group A and B. The observation walkthroughs were conducted at 09:15, 11:15, 13:15, 15:15 and 17:15 with the use of a floor plan template. In order to facilitate a more structured observation methodology, and to enhance the analysis process, all workspaces on the template were given a specific reference letter. In addition to the templates, a short instruction manual on how an observation had to be conducted, as well as how to identify the use of a workplace, was prepared.
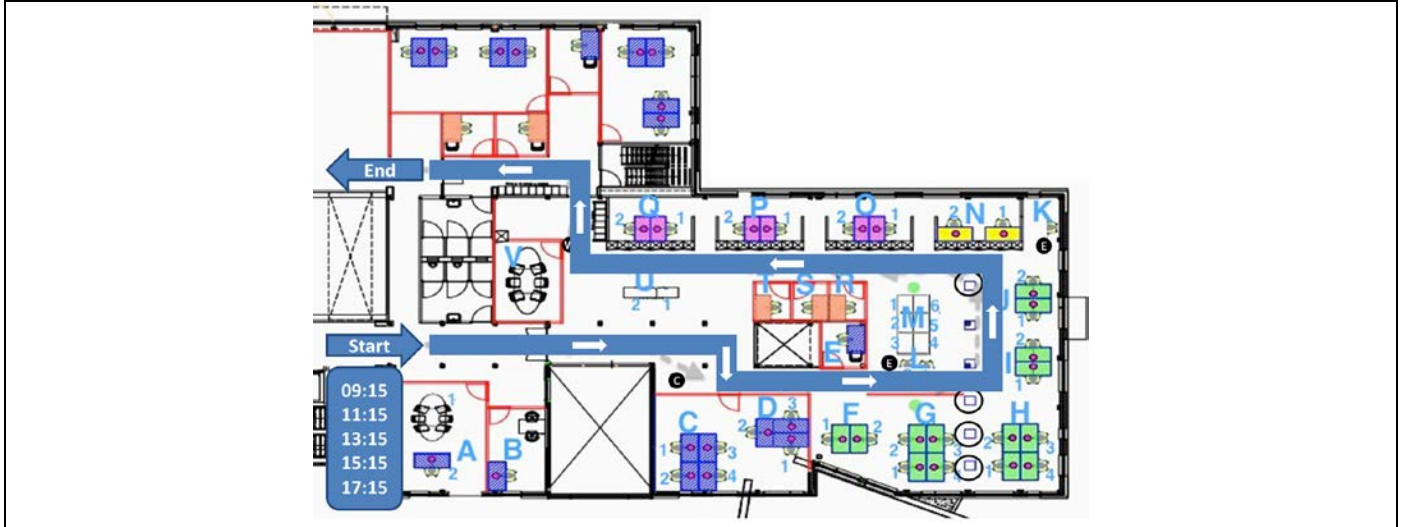
Figure 4: Observation walkthrough template.

3.4.3   Developing the interview protocol

After completion of the questionnaire survey and the observation walkthroughs, individual interviews with selected members of staff were held. The purpose of these interviews was to create an opportunity to investigate in greater depth specific issues of relevance identified during the questionnaire analysis and the observation walkthroughs. All interviews were conducted by two members of the research team, after which all interviews were transcribed.

4   ANALYSIS AND INTERPRETATION

4.1   Questionnaire analysis

The questionnaire was sent to a total of 94 employees. Given the small number of the target group, a response of at least 90% (85 out of 94) was required for a truly representative outcome. In total only 54 responses were received, resulting in a response rate of only 57,4%. The analysis of the questionnaire focussed specifically on identifying aspects of dissatisfaction, and the improvements needed to (i) increase satisfaction and (ii) fine-tune the overall NHTV@Work concept.

OUTCOMES OF THE QUESTIONNAIRE REGARDING THE AVAILABILITY OF WORKPLACES			
Type of workspace	**Score**	**% Negative**	**Comments**
Long-stay / general	6,8	14,8 %	• On busy days (Monday morning, Tuesday and Thursday) not enough spaces available.
Short stay	6,9	9,3%	• Badly designed • Docking stations missing • Landline phones missing
Quiet workspace	5,8	27,8%	• Too much noise • Not enough space on Monday morning • Unpleasant workspaces • Lack of possibilities • Signage missing
Enclosed concentration	5,5	27,8%	• Not always used as designated for • Bad acoustics • Bad climate • Not enough spaces available
Meeting rooms	5,8	31,5%	• Not enough options (more than 1) • No inspiring lay-out

Table 3: Most noticeable outcomes of the questionnaire analysis regarding the availability of workplaces.

OUTCOMES OF THE QUESTIONNAIRE REGARDING THE PHYSICAL ENVIRONMENT		
Negative aspects	Poor indoor climate:	• Not enough oxygen • No steady temperature
	Bad acoustics:	• Sounds travels too far • Too much noise when busy
	Not enough (individual) storage space	
Positive aspects	Adjustability of desks and chairs	

Table 4: Most noticeable outcomes of the questionnaire analysis regarding the physical environment.

General remarks to open questions regarding the functionality and serviceability of the SIB-version of the NHTV@Work concept		
#	Statement	Score
1.	The concept suits the work processes.	6.3
2.	An open and transparent work environment suits our work processes.	7.2
3.	Sharing workplaces suits our organization.	7.0
4.	I can always find a workspace in the staffroom.	6.3
5.	I can always find a workspace in the staffroom, which actually suits the specific activities I need to perform at that moment.	5.6
6.	The level of satisfaction strongly depends on the behaviour of employees and less on the concept itself.	6.5
7.	The open and transparent work environment leads to more interaction (both formal and informal) between colleagues and therefore a better atmosphere (collegiality).	7.3

Table 5: Most noticeable statements from respondents to the open questions on the effectiveness of the new workplace concept.

Specific remarks in response to open questions regarding IT and communication in the SIB-version of the NHTV@Work concept	
Topics of discussion:	• Citrix is terrible • Not enough docking stations provided • Not enough support for the concept • Not enough telephones • Need for a mobile system • Forgetting to log-in to landline phone
Regarding the development of the concept:	• Lack of involvement staff • No clear reasoning behind concept • Concept is more important than the needs of staff • First the concept, than the guiding • Waste of money, only 6 workplaces extra
Issues related to the implementation of the concept:	• Too much noise • Behaviour is a problem • Not enough places to concentrate • Not enough meeting rooms • No space for private phone calls • Disturbance of others when telephoning

Table 6: Most noticeable remarks from respondents to the open questions on IT and communication.

4.2   Observation Execution and Analysis

Before the observation phase began, an indicative level walkthrough (Preiser and Schramm, 2002) was done in order to document the correct layout of workplaces, meeting spaces and support spaces in the SIB Staff Room (Area 1

4.2.1   Outcomes from the observation analysis

i)   *Vacancy and reserved during the day* – At the moment of the observations, most of the workspaces were either in use or reserved. From 15:15 it was more likely to find more vacant workspaces, and at 17:15 most workspaces were vacant. When it comes to reserved workspaces, it was quite noticeable that books and materials on desks, or coats on chairs, were used to reserve desks. Even though this is not in accordance with the "rules" of a clean-desk policy as employed by the NHTV@Work concept, nothing was being done to persuade staff to change their behaviour.

ii) *Employees sitting at the same desks* – Quite obvious was the observation that some employees prefer to always use the same workspace. This situation particularly applies to workspaces C, E, F, G, H, I and J (see Fig. 3).

iii) *Meetings* – Another observation was that meetings or conversations were held in areas that were meant as quite areas. Many conversations also took place in the concentration cubicles E, R, S, and T, thereby causing disturbance and annoyance to others users of the adjacent concentration or quite areas. During the interviews this issue was mentioned as contributing to dissatisfaction with the provision of areas for concentrated / quiet work.

iv) *Shared- and clean desk policy* – During the observations, empty coffee cups and trays were seen on unused workspaces and in the informal meeting. Most noticeable was the fact that employees using the same workspace tend to build up a collection of books, papers, and trays at the specific workspace, resulting in a culture whereby the clean-desk policy is disregarded.

v) *Behaviour vs. intended use* – At all workspaces activities were executed that do not fit the function of that specific workspace. Often meetings, conversations and telephone calls occurring at workspaces caused a disturbance to surrounding users – especially those of the quiet and concentration areas. The openness and acoustics of the areas also seems to contribute to the distribution of noise in the SIB Staff Room.

To conclude, workplaces C1, C2, F1, F2, H3, J1, J2, N1, O1, P1 and S (see Fig. 3) are considered to be the most popular workplaces. During the day most workplaces were in use or reserved, and from 15:15 on more vacant. The shared desk policy and clean-desk policy seem to not function properly as staff seems to have favourite desks and often use books and materials to reserve desks. Informal meetings and conversations occurred all over the Staff Room in disregard for the different functional zones.

4.3 Interview Execution and Analysis
The interview questions were carefully coordinated with those asked in the questionnaire, as well as with observations from the walkthroughs. As such, the interviews served to verify conclusions drawn from self-reporting done by employees in responding to the questionnaire survey. Based upon the questionnaire and observations, notable actions and opinions of employees could be used to form more in-depth questions about, and discover the reason behind the actions and happenings observed in the staff office.

4.3.1 Outcomes from the interview analysis
The original goal of the interviews was to deepen our understanding of the level of (dis)satisfaction by members of staff with the SIB-version of NHTV@Work. However, during the interviews other notable issues arose.

i) *The ability to perform concentrated work* – From the interviewees, seven out of eleven stated that the ability to perform concentrated work was a difficulty in the staff room. From the seven that had difficulty with performing concentrated work, two stated the situation was improving and one stated that although concentration was an issue, it was not considered problematic. From the four that stated it was not an issue, two said to mostly work in closed silent areas such as areas N, O, P, Q and U, S, T, E (see Fig. 3). The main reasons mentioned for having difficulties concentrating were:
   - Noise from colleagues in the surrounding area
   - Telephone calls (either due to the long duration thereof, or a loud voice)
   - The general acoustics in the staff room.

ii) People walking through the staff room, as well as communication between members of staff (ether planned or unplanned) further contribute to the overall perception of noise in the staff room.

iii) *Clean-desk policy* – All interviewees stated that the clean desk policy does not work well during the day. Seven interviewees said that as long as the desks are clean at the end of the day they are satisfied. One interviewee mentioned the policy does not work, as only 50% of the desks are clean, and four interviewees mentioned that some of the employees do not comply with the policy to demonstrate their dissatisfaction with the policy. Reasons mentioned to not comply with the policy during the day were mostly out of efficiency and temporary absence of employees. Another reason mentioned was the lack of storage space.

iv) *Indoor climate* – Only three out of eleven interviewees mentioned that in spite of recent improvements in the indoor air quality, there was still room for improvement. In the interview with the remaining eight the subject was not discussed. The three interviewees mentioned thermal discomfort due to it often being too cold in winter and too hot in summer. Two out of three also mentioned getting headaches and two (of which one did not mention anything concerning a bad climate) mentioned the lighting could be improved.

v) *Communication to employees regarding NHTV@Work* – Concerning the communication and involvement of the employees in the development of the concept, five out of eleven stated to be satisfied with the communication. In two of the interviews the subject was not discussed. Four out of eleven interviewees stated they are not satisfied with the communication; one stating a wrong approach, and that the concept forces people into certain behaviour. Other reasons were that employees were not assisted in understanding or learning how to correctly use the new workplace environment.

vi) *Behaviour vs. intended use* – From the interviews it was concluded that the different areas within the staff room are not always used according to the function of the specific area. This is mainly due to the fact that employees tend to use the same workspace all day long, instead of consciously choosing the correct workspace for the task at hand. Only one interviewee clearly stated to alternate desks and areas. Reasons for not changing to different workplaces relate to preferences regarding daylight, the type of area, and preferences for working together with specific colleagues. None of the employees felt bothered by the fact that the same colleagues use the same desks each day. Two interviewees stated that it could be annoying for employees who come in to the office later in the day. Also, it is not clear to employees what the function of the different areas is, as telephone calls and talking / conversations occur throughout the staff room.

vii) *Satisfaction with NHTV@Work* – Ten out of the eleven interviewees stated to be overall satisfied with both the NHTV@Work concept in general, and the SIB-version thereof. One interviewee stated to not be satisfied with the current situation as the concept did not fit the natural behaviour of employees.

In general, the overall opinion of interviewees regarding the new workplace environment is positive, or at least neutral about the concept. Nine interviewees stated that the concept fits the culture of the SIB-location. In two interviews this was not mentioned. Almost all interviewees stated that the concept helps in creating and sharing knowledge between colleagues as communication is stimulated and cooperation has increased.

5   CONCLUSIONS AND RECOMMENDATIONS

5.1   General Observations
Through observing and interviewing members of staff using the new SIB Staff Room, it became clear that the communication has improved and that employees are satisfied with the way of cooperation and sharing of knowledge. Most importantly, employees see these improvements as directly related to the positive effects of the new NHTV@Work workplace concept.

NHTV@Work implies a flexible way of working based on the principles of an activity-based appropriation of different types of workspaces, meeting spaces and support spaces. Changing the workplace concept therefore also implies that users need to (be helped to) change their behaviour and way of using such an environment. During the observation walkthrough, as well as from self-reporting to the questionnaire survey, is was noticed that although staff do indeed move through the office more, they still do not optimally apply the principles of activity-based working. Employees do not consciously choose workspaces to suit the type of work they need to perform, resulting in a new work environment being used according to "old" behaviours. This does not seem to be connected to age, position or other aspects that separate the employees from one another.

Surprisingly, results from the interview in which employees were specifically asked about the clean-desk policy, indicated that this was generally accepted. However, employees consider it to be inconvenient and inefficient to clean up during the day. Employees do however, agree that it is good practice to clean desk at the end of a working day. Workspaces with materials on it only seemed to become a problem when it was not cleaned at the end of the day. This also has to do with the fact that most employees admitted having favourite workplaces and knowing other colleagues having them as well. As was also observed during the observations, employees often tend to work at the same desk and frequently leave their belongings overnight in order to safe time getting started when coming into the office the next day. During the observations it was seen that chairs were not returned to workplaces from where they were taken (for impromptu meetings as other workspaces) and coats were hanging on the chairs (even though a wardrobe is provided). This was also surprisingly accepted amongst the interviewees. Another observation was that the workplaces were not used according to the concept. Often, meetings, conversations and telephone calls occurred in the quiet and concentration areas. This was also confirmed during the interviews since all interviewees mentioned the distraction caused by these activities. Especially the matter of having telephones in the concentration workspaces was mentioned as something which should be reconsidered.

5.2 Recommendations

The research identified a disparity between the intended goals and ambitions for using the new work environment, and how it is being perceived and used by employees. Recommendations for improving the serviceability of the SIB version of NHTV@Work are:

5.2.1 Concentration

The ability to perform work in a concentrated manner, and the suitable facilitation thereof, is a crucial aspect of employee satisfaction in (new) workplace environments (Been & Beijer, 2013; Maarleveld & Been, 2011).

i)   *Telephone calls* – Making telephone calls within the office, leads to distraction and disturbance amongst the employees. The fixed phones on the desks lead to phone calls and therefore noise within the open area. Employees also make personal or confidential phone calls in the office, which leads to disturbance as well. The solution to this problem could be to introduce a mobile telephony system.

ii) *Dedicated space for calling* – To solve this problem, it is suggested to create two phone booths in area "K" as indicated in Figure 5. During the observations this area appeared to be mainly unused, thereby making it suitable for this recommendation.

5.2.2 Acoustics

As many interviewees mentioned, improving bad acoustics is an important point of attention for NHTV@Work.

i)   *Improving the acoustics in the quiet workspaces* – The solution for this improvement point is to add soundproofing materials to the affected areas within the staff office. A recommendation would be to add for example glass screens on top of the areas "N", "O", "P" and "Q" and to close the cubicles of completely (Fig. 5). Glass doors can be added to the cubicles, which can be closed or stay opened, shutting out sound as

well as giving a signal in wanting to be disturbed or not. That way the sounds of colleagues passing by and talking can be shut out more effectively and the workplaces become more of a quiet area.

ii) *Improving the acoustics in the concentration workspaces – T*he areas "E", "T", "S", "R" are used as concentration workspaces, but are not functioning properly due to the thin walls between them. To solve this problem, the cubicles can be made soundproof by using soundproof materials, as well as to remove the main source of the disturbance – the fixed telephones in these concentration workspaces.

iii) *Creating "Skype-rooms"* – Employees are increasingly making use of video-communication software such as Skype. Currently staff tend to use the concentration workplaces for these calls, thereby contributing to existing problems experiences with telephone calls on these rooms. In order to address this issue, it is suggested that special "Skype-rooms" are created which can be used by both staff and students.

iv) *Behavioural issues* – In addition to the abovementioned proposed changes to the physical environment, acoustics could also be improved by addressing user-behaviour. During the interviews is was mentioned frequently that the relatively high frequency of "walking-and-talking" between colleagues in the area between the concentration and quiet workspaces, contributes to the general noise level and disruption in the staff room. It is therefore recommended that an awareness program is set up to help employees to better understand the different areas in the office, as well as their nature and how to properly adapt their behaviour.
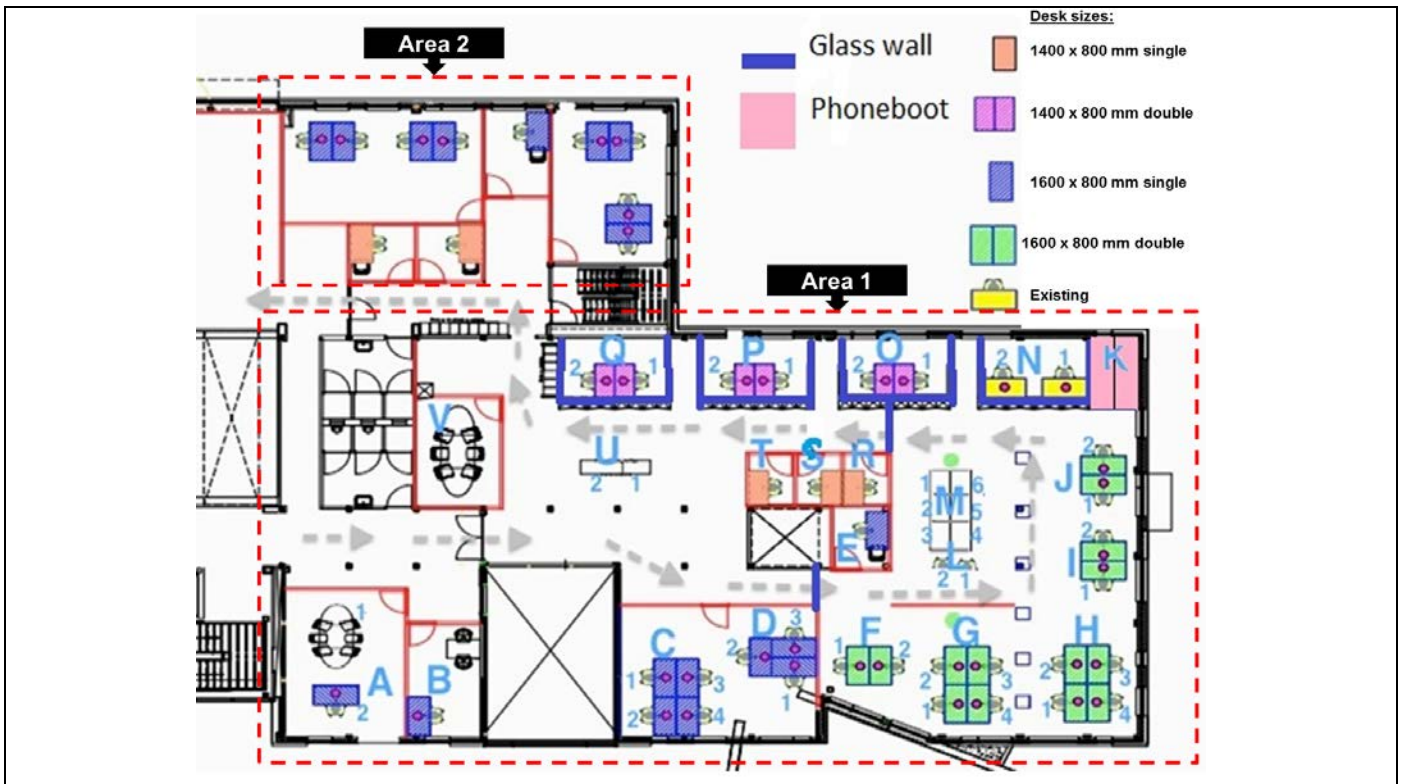

Figure 5. Suggested improvements to the physical environment of the SIB-version of the NHTV@Work concept.

5.2.3 Lack of meeting area
The high level of impromptu meetings between colleagues is part of the intended effect of the new work environment. However, the unintended consequences of improving the ability to meet and communicate with colleagues is that it might cause unnecessary disruption to colleagues working in the immediate vicinity of such impromptu meetings.

i) *Emphasising meeting room availability* – Emphasizing the present meeting areas in the staff office such as areas "U" and "V" can help to solve this problem. These areas are relatively close to the different workspaces and employees should be encouraged to move to these meeting areas. this solution is primarily a behavioural issue which needs to be addressed though an awareness program as already mentioned.

5.2.4 Awareness of the different functional areas

Not all employees are aware of the different functional zones in the office, their nature and how their behaviour should be adapted when working in these areas.

i) *Emphasising the functional zoning* – When employees are not made aware of their actions, and the effects thereof on their colleagues using the same workplace environment, it could lead to distraction and annoyance amongst staff. To solve this issue, the staff could be reminded of the functions and the intended use of the area through a briefing and recap of the improved and renewed concept. Communicating the different functional zones through the use of colour or icons could also be used as visual reminders of how to use and behave in the specific zone or workspace.

ii) *Creating a sense of ownership* – In providing an awareness program care should be taken to make sure all staff are involved. By making employees more aware of the different functional zones and how it could be used to improve their own productivity, a sense of ownership can be created. This is crucial if the new work environment is to function on the basis of social control rather than being "policed".

5.2.5 ICT

Employees also seem to be experiencing difficulties with the current ICT system. More staff are currently making use of digital media, and videoconferencing. Combined with the ambition to be more sustainable and use less paper, an optimally functioning ICT environment could help to achieve these goals. In this regard it is of special relevance to make sure computers have the required functionalities (suitable graphic cards, solid-state drives, etc.).

5.2.6 Indoor climate

Discomfort due to poor indoor climate was frequently mentioned during the interviews. More attention is required in this regard in order to address all employee complaints related to a poor indoor climate.

5.3 Suggested improvements to implementing NHTV@Work

As far as the overall NHTV@Work workplace concept is concerned, the current research has identified a number of key areas if importance which should receive proper attention in terms of fine-tuning the concept for future improvements (Archimedesstraat and Sibeliuslaan) and locations where it is still to be implemented:

- The concept should be developed with the specific functional requirements of users in mind, and NOT external to the organisation
- Assisting employees to change their behavioural change is a precondition for working in a new workplace environment
- Physical changes to (existing) environments should ONLY be considered and executed once proper consultation with the needs and requirements of users has taken place
- Employees MUST understand the functional zoning suggested by the workplace concept in order to also understand the required behaviour
- Pay attention to greening of the office environment
- Improve the acoustics (separation of those who need silence/collaboration)
- Attention for aspects of thermal comfort in the indoor climate due to the intensification of use resulting from new workplace concepts

- Sufficient storage space
- Sufficient meeting spaces;
- Make use of mobile telephony;
- NO telephones in concentration workspaces;
- Provision of phone booths to facilitate telephone calls
- Proper signage / icons to communicate desired behaviour and intended use
- Facilitate a shared awareness and ownership of the concept.

6   FUTURE RESEARCH

The current research focussed exclusively on the manner in which the NHTV@Work concept was implemented in the SIB Staff Room. Future research on this topic will also focus on:

- Extending the evaluation to include all academic facilities in the SIB-location;
- Performing a comparative analysis of the NHTV@Work concept as currently implemented in the Archimedesstraat and the Sibeliuslaan;
- Extending the comparative analysis to include all NHTV-locations where the NHTV@Work concept has been implemented;
- Performing a strategic-level research on the implementation of new workplace concepts in academic environments, with application of the NHTV@Work concept as case study.

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