

## Active utilisation of different zones in ABW office - relationships to employee experience

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### ABSTRACT

Activity-based offices has been implemented for a couple of time, but only recently the way activity-based offices are practically used by the employees has attracted research interest. In this study results of a comprehensive post-occupancy survey in a Finnish governmental organization are provided. The post-occupancy survey measured several aspects of the actual ABW office use both in individual and work community level: (1) which of the working zones employees actually utilised; (2) how often they utilised different working zones; (3) how many times per day employees switched their working zone; (4) how much time they spent when switching zones per day; (5) how the working zone specific speech rules and other codes of conduct were applied and obeyed; (6) were the differences in working zone switching behaviour related to differences in the employee and workplace experiences. The results of this study showed that not all working zones of the activity-based office were used actively. The basic principle of utilizing different working zones for different work activities was not fully applied. A big share of employees do not switch their work station during the work day at all. The behavioural norms regarding the use of different working zones were not fully obeyed. Those who switch their work station at least once in a working day were more proactive planners of their work and they manage more actively their work environment. Overall sense of self-rated productivity and work well-being did not differ between switchers and non-switchers. The overall sense of community was high among work communities, and the activity-based working does not seem to harm work community.

### Keywords

Activity-based office, Speech rules, Employee experience, Sense of community, New ways of working

### 1 INTRODUCTION

Activity-based working (ABW) and activity-based offices (ABO) with a variety of working zones and non-assigned workstations has been applied for a while as a more cost and energy efficient office solution compared to cell offices and conventional open-space offices. Conventional open-space offices are criticized for their noise and constant flow of interruptions the shared environment generates. Activity-based offices provide possibilities to find suitable spaces to work both in solitude and silence, and to collaborate and interact. However, empirical results about the experiences related to possibility to concentrate and on the other hand to collaborate smoothly in ABOs has been mixed. While the office layouts following the idea of providing different zones for different work modes and related employee experiences has been studied widely, the actual extent of use of different zones has not been studied that often (see as an exception e.g. Haapakangas et al, 2018; Hoendervanger et al., 2019). In addition, the central and distinctive element of ABOs making them work properly – the speech rules and other codes of conduct associated to different working zones of the office – has not generated much research interest (see as an exception e.g. Bababour Chafi and Rolfö, 2019; Bababour 2019; Franssila & Kirjonen, 2022).

In this study results of a comprehensive post-occupancy survey in a Finnish governmental organization are provided. In the study several aspects of the actual ABW office use both in individual and work community level were analysed and following research questions are explored:

1. which of the working zones employees actually utilised;
2. how often they utilised different working zones;
3. how many times per day employees switched their working zone;
4. how much time they spent when switching zones per day;
5. how the working zone specific speech rules and other codes of conduct were applied and obeyed;
6. were the differences in working zone switching behaviour related to differences in the employee and workplace experiences.

## 2 BACKGROUND

The impacts of activity-based working on various employee experience measures have been according to the earlier research mixed. According to the recent review of research on activity-based working over last ten years, shortcomings related to the activity-based working are not related to the ABW concept itself, but rather to the way how working is implemented and how occupants use the work environment (Marzban et al., 2022). While ABOs provide new resources and new means to support ones' ability to execute knowledge work and control work environment, the ways of working in a new way and utilizing the new premises has not developed in the same pace. In one of the earliest studies observing work zone switching in ABW office, Appel-Meulenbroek et al. (2011) found out that 68% of the respondents never switched their work station during working day. Hoendervanger et al. (2016) reported in their study of activity-based working, that workplace switching is very rare, only 4% switch multiple times per day, and nearly half (48%) switch never or less than once a week. In the multiple-case study of ABW change, Babapour Chafi and Rolfö (2019) found out that the switching behavior varied from case to case. In most of the case sites at least half of the informants changed their workstation at least periodically, but in the one case site the informants mainly chose the same work station from day to day. On the other hand, Haapakangas et al. (2018) reported in their study, that majority of respondents (72%) switched their workspace at least once a day. In a similar vein, Windlinger and Kim (2020) reported, that 70% of their respondents switched their workplace voluntarily at least once a day.

In general, very little is known about actual frequencies of using different zones in ABW offices, or about the amount time spent in working in different zone. In their experience-sampling study Hoendervanger et al. (2022) made a remarkable finding, that most of the work (72%) was executed in open work settings, and that individual high-concentration work was less often performed in closed work setting than in open work setting. One possible reason behind the reluctance to switch ones' working zone in ABW office can be the time lost in the transitions from one zone to another and in the setup of the workstation in the new zone. Couple of earlier studies have observe the estimated time spent in transitions. Respondents in the study of Rolfö et al. (2018) spent daily in average 7.84 minutes for finding appropriate workplace. In Haapakangas et al. (2018) nearly 50% of respondents spent at least 6 minutes per day for looking for a workspace.

The most common behavioral codes or norms in ABW office regard desk-sharing and the clean-desk policy. These norms apply to all zones in activity-based office, but each zone should have also zone-specific speech and phone/video rules and norms considering acceptable periods of non-attendance in the claimed work-stations. The application of speech rules and other behavioral norms and their success in ABW has attracted only scant attention in earlier

studies. Rolfö et al. (2018) reported about negative effects of rule ambiguity on performance and satisfaction in ABW. Babapour Chafi and Rolfö (2019) found out in their qualitative cross-case study, that the level of formalization and unambiguousness of the behavioral norms varies from case to case, and violations of behavioral norms occur often.

It can be concluded from the earlier studies, that both the actual use behavior of different zones and the status of application of behavioral norms in ABW offices requires extra attention.

### **3 RESEARCH SITE, METHODS AND DATA**

The study was conducted in the office site of a governmental organization in Finland in 2019. The organization with nearly 400 employees moved to the activity-based office in 2018. The staff participated into training related to activity-based working and as part of the training the code of conduct and speech rules of the each working zone were created in participatory manner. The participation on the training was not mandatory. Part of the employees had already practical experience about working in activity-based office without assigned seats, but some of the employees were new to activity-based working. Participation rate into the training was quite low, appr. 10% of the staff participated into the training.

The activity-based office was located on three floors in old, renovated office building. Each of the floors of the office had slightly different layout. The zones in each floor differed in their size and slightly in their shape. To maintain anonymity of the building and the organization, actual floor plan of the office is not presented. Characteristics of the office spaces in each of zones were the following:

- open workstation zone for individual and pair work with a permission to speak, take calls and participate into video meetings involving moderate amount of speaking (variable number of work stations);
- open but acoustically protected work station zones for individual work without permission to speak, take calls or interrupt by contacting face-to-face someone working in the zone (variable number of work stations);
- open collaborative meeting zones for informal and ad hoc meetings and gatherings not requiring high privacy with variable furniture (from formal to informal);
- walk-in rooms for individual work for phone and video discussions requiring confidentiality and for side-by-side work (but not for silent individual work);
- break-out spaces for recreation and informal gatherings;
- reservable meeting rooms for internal meetings (various amounts and sizes);
- reservable meeting rooms for external meetings (various amounts and sizes);
- reservable project rooms for internal, periodical task-force working.

In each floor of the office there was available all of the above working zones except the reservable meeting rooms for external meetings and project rooms for internal task-force working were available only in one floor.

The data for the study was collected with an extensive post-occupancy survey. The activeness of use of different zones, experiences about appropriateness of the zoning and codes of conduct, aspects of quality of work community issues and comprehensive employee experiences concerning work environment, ways of working in individual and group level, personal work well-being and self-assessed productivity were operationalized in the survey. The survey items for operationalizing use of different zones, experiences about appropriateness of zoning and codes of conduct, sense of community and sense of access to colleagues were developed for the purposes of this study. The survey items operationalizing employee experiences concerning physical and virtual work environment, ways of working in individual and group level, work

well-being and self-assessed productivity were obtained from the Smart Ways of Working - framework (Palvalin, 2017; Palvalin 2019).

The post-occupancy survey was sent to all employees of the organization after working over one year in the new office site. Altogether 227 responses were collected to the survey.

#### 4 RESULTS

In the next sections, first the descriptive statistical results of actual usage of the different zones of the activity-based office are presented. After that, assessment of the codes of conduct and expected behavior in the activity-based office are discussed. Next, experiences and practices related to the sense and maintenance of work community are explored. Finally, employee experiences related to the different facets of work environment and work practices are compared between active switchers of working zones to the experiences of non-switchers. Switching is regarded as active, if the respondent switched their work station at least once a day.

In general, the switching of the working zone during the working day was not common practice to all respondents. Only half of the respondents switched their work station during the working day at least once or more often. Nearly half of the respondents never switched their work station during the day. The average time spent per day on searching and reaching new work station was only 1-5 minutes, which reflects the big amount of employees who do not switch their work station during the at all (see Table 1.).

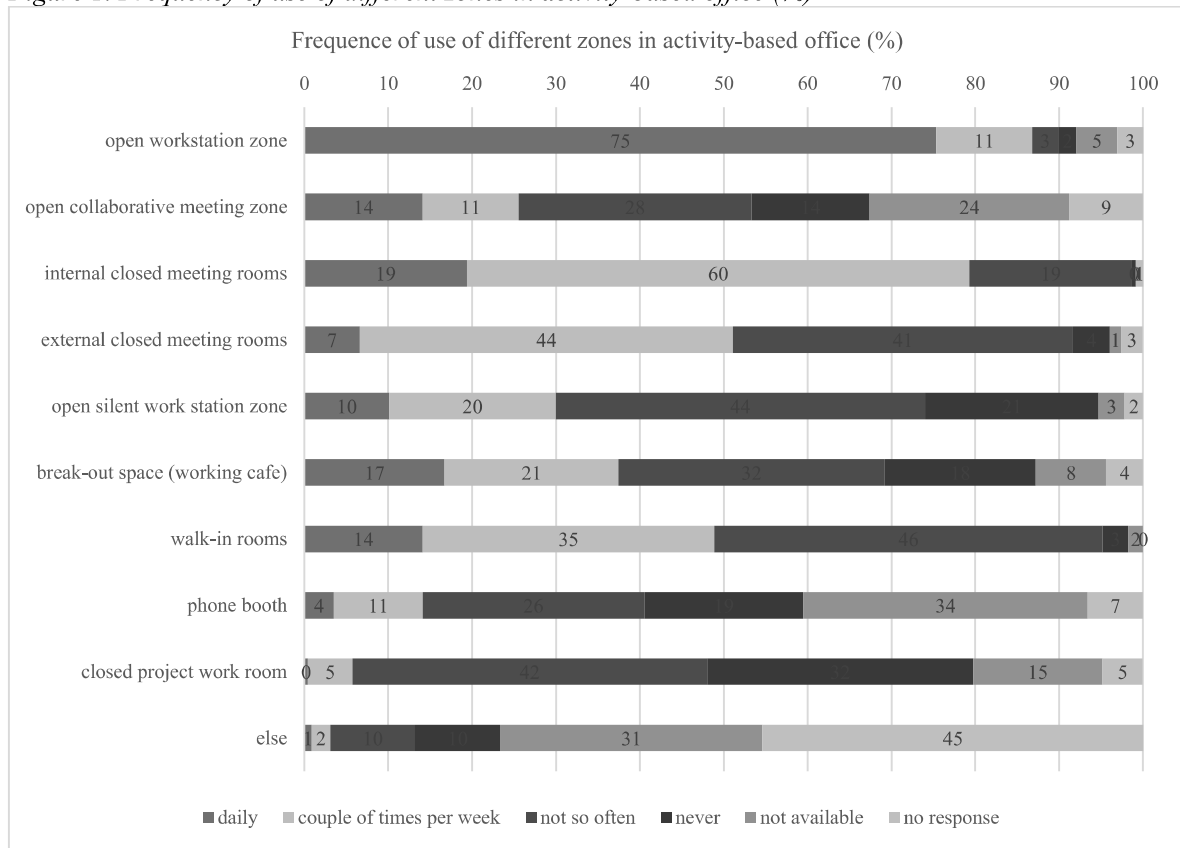
Table 1. Number and frequency of work station switches

<b>How many times during the work day you switch your work station?</b>		
number of switches	amount of respondents	% of respondents
0	112	49,3
1	58	25,6
2	34	15,0
3	10	4,4
4	9	4,0
5	2	0,9
6	1	0,4
8	1	0,4
Average time spent on searching work stations during the working day: 1-5 minutes		

##### 4.1 Actual use frequency of different zones in activity-based office

Activity-based office under study provided wide variety of different kinds of working zones both for individual work and for collaboration. The most popular and most frequently used work zone was open workstation zone, where it was possible also to speak and take calls. What was distinctive was that the open silent workstation zone was not very popular and there was a big share of respondents (21%) who never used the silent zone. What was interesting to observe was that not all of the respondents recognised that their office included certain working zones or spaces. This indicates difficulties some of the respondents experienced when interpreting the function or characteristics for certain spaces in their ABO (see Figure 1.).

Figure 1. Frequency of use of different zones in activity-based office (%)

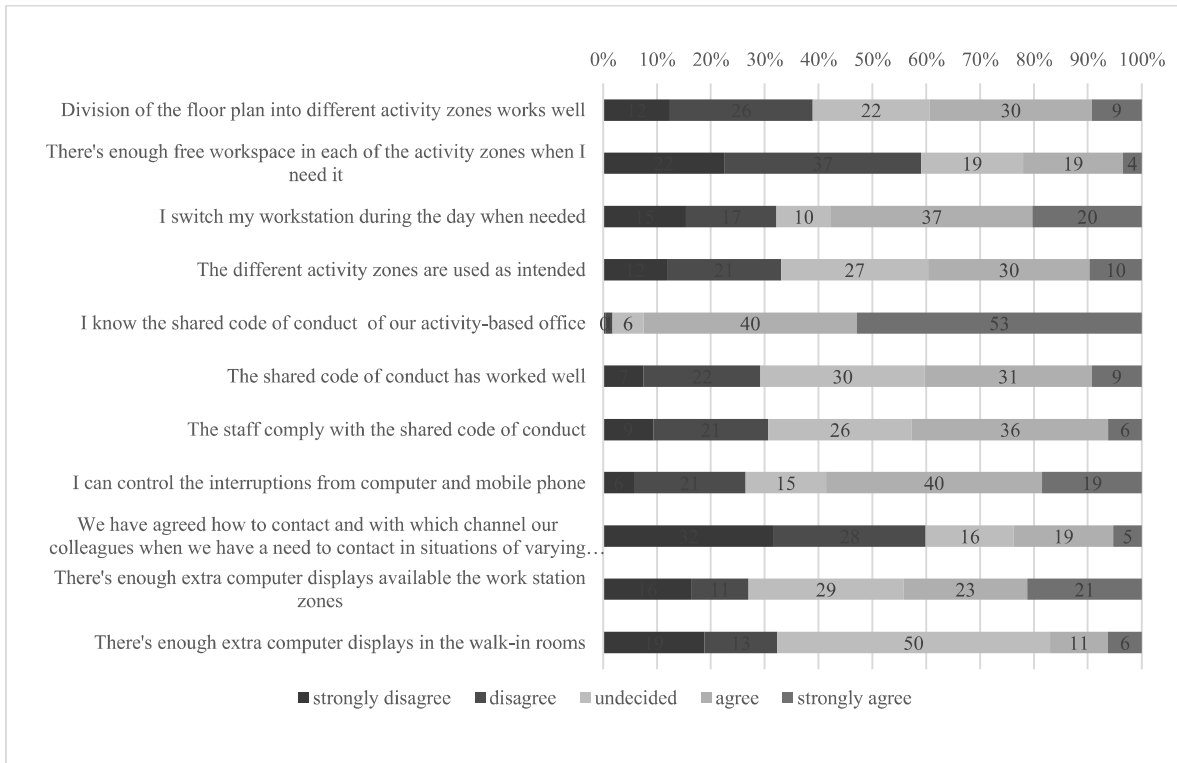


#### 4.2 Codes of conduct and other behavioral practices of the different activity zones

Working zone-specific codes of conduct, speech rules and other explicit behavioral agreements make activity-based work environment “work”. Only physical layout or certain interior design solutions do not make activity-based office serve different modes of knowledge work and meet associated criteria for efficient and appropriate working space. Also the behavior of users of the shared spaces needs to be designed and modeled. Without agreed behavioral norms activity-based office do not meet the expectations to provide better work environment compared to the conventional open-plan office. If the behavioral norm of not occupying a certain work station continuously for whatever work activity regardless of the speech rule of the associated working zone is obeyed, this kind of usage “spoils” the work environmental quality of the associated working zone. For example, if walk-in rooms, which are designed and dedicated for temporary work requiring privacy and acoustic proofing are instead used for silent individual work from day to day, the space is not in an appropriate use and this usage convention may generate scarcity of these spaces for their appropriate use.

In this study various aspects of the functioning and status of behavioral norms were addressed (see Figure 2). It was found out, that less than half of the respondents had an experience, that the codes of conduct and behavioral norms were adhered. There was also considerable share of the respondents (over 30%), who do not switch their workstation during the working day at all. This kind of behavioral conventions may explain partly the experience of many respondents, that there’s not enough free workspace in each of the activity space when one needs it.

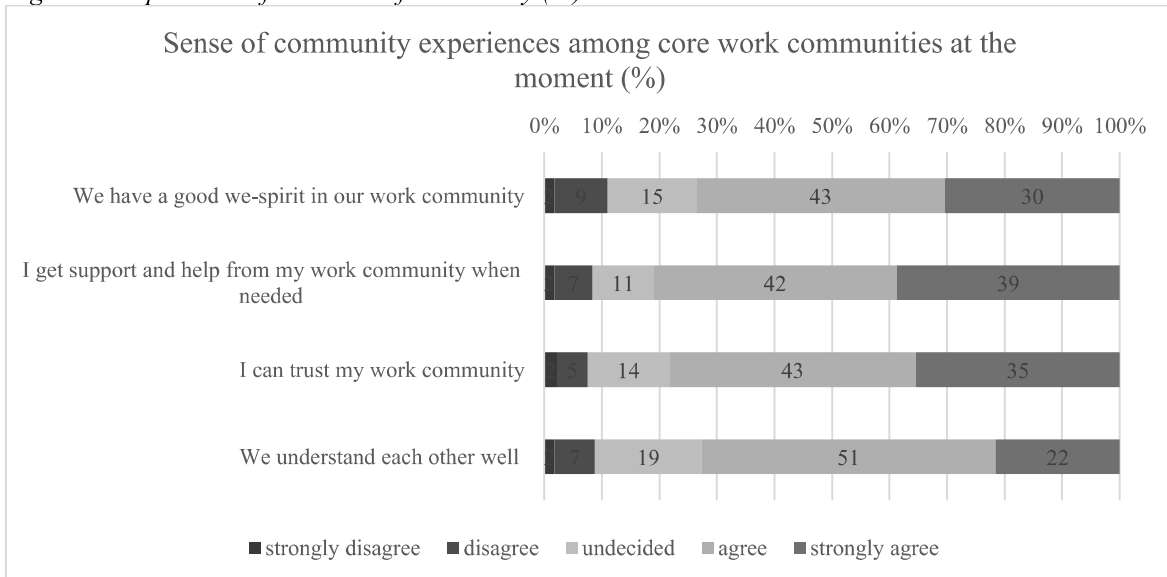
Figure 2: Assessment of codes of conduct and other behavioral practices of the different activity zones



### 4.3 Sense of community

A common worry and concern related to the activity-based office without assigned seats is the expected loss of the sense of community, we-spirit and trust. In this study it was found out, that the sense of community is in high level, and only small share of respondent express concerns related to it (see Figure 3.).

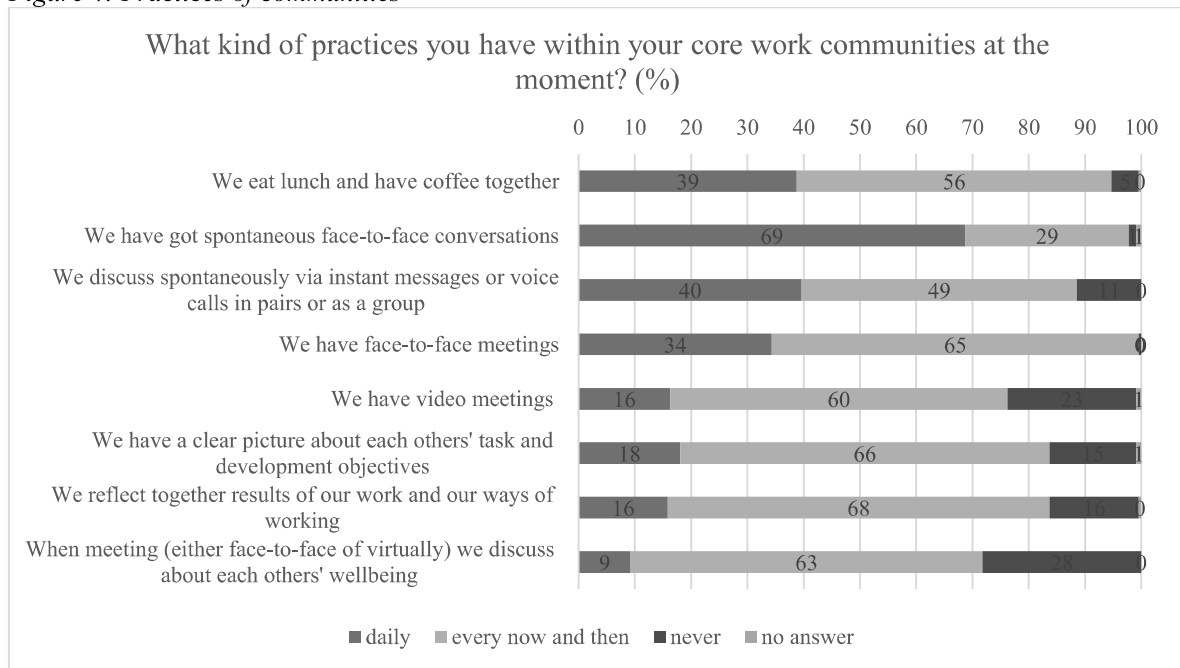
Figure 3: Experience of the sense of community (%)



#### 4.4 Practices to maintain sense of community in the activity-based office

While the sense of community, and the maintenance and building work of communities are of great concern in activity-base office settings, certain practices may indicate if the concern is real. In this study frequency of variety of practices related to the daily maintenance of community were observed (see Figure 4). It was found out that variety of practices and habits related to maintenance of community were actively applied.

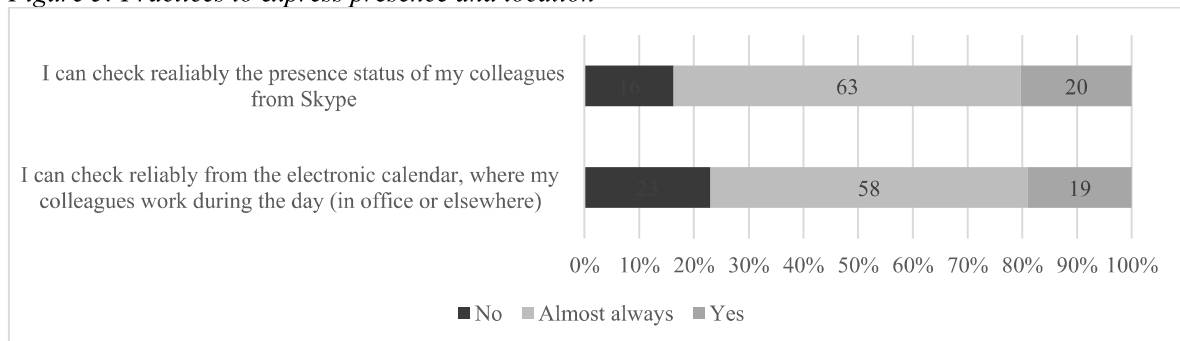
Figure 4: Practices of communities



#### 4.5 Practices to express presence and location

In activity-based office without assigned seats you cannot anymore expect to find certain colleague regularly from the certain part of the office space. In this study new practices to support observing the presence and awareness of the working location of colleagues were studied. It was found out that a share of respondents still had difficulties to be able follow their colleagues present and location with the help of electronic means (see Figure 5.)

Figure 5: Practices to express presence and location



#### 4.6 Employee experiences and switching behavior

The core promise of activity-based working is, that if you actively manage your work environment by choosing a working zone which support the needs of your current work activity, your work environment experience should be satisfying. If your work activity mode changes during the day, e.g. from an spoken interaction with other colleagues to an activity which require absolute silence, you should switch your workstation into appropriate working zone. Are those employees switching more frequently their working station and working zone different or does switching has an impact on employee experiences? In this study various facets of employee experience were analysed and potential differences between switchers and non-switchers were studied.

##### 4.6.1 Physical work environment

The experiences of affordances of physical work environment did not differ between switchers and non-switchers. However, the switchers were statistically significantly more critical concerning the ergonomic arrangements of the works stations at the workplace (see Table 2).

Table 2. Experiences of physical work environment.

Variable	No switching (n=112)		At least one switch per working day (n=115)	
	Mean	SD	Mean	SD
There is a space available for tasks that require concentration and peace at our workplace when needed.	3,30	1,35	3,04	1,42
There are enough rooms at my workplace for formal and informal meetings.	2,60	1,23	2,64	1,32
The facilities at my workplace enable spontaneous interaction between workers.	3,63	1,21	3,44	1,26
The ergonomic arrangements of the work stations at my workplace are in order.	3,50 **	1,31	3,02 **	1,37
There are generally no disruptive factors in my work environment (like sounds or movements).	2,29	1,30	2,25	1,26
There is a place in which I can discuss or talk on the phone about matters which I do not want others to hear.	3,21	1,37	3,21	1,37
The facilities at my workplace are conducive to efficient working.	2,88	1,18	2,77	1,27
Scale: 1 = strongly disagree, 5 = strongly agree				
Statistical significance of the difference of the means: *** p<0.001, ** p<0.01, * p<0.05				

##### 4.6.2 Virtual work environment

Experiences of the affordances of the virtual work environment differed between switchers and non-switchers in several aspects. Switchers were statistically significantly more critical concerning the experiences of usability of the software and access to information regardless. They were also less satisfied with the mobile devices provided by the employer (see Table 3).

Table 3. Experiences of virtual work environment.

Variable	No switching (n=112)	At least one switch per working day (n=115)



	Mean	SD	Mean	SD
The usability of the main software for doing my work tasks is good	3,43 *	1,25	3,07 *	1,20
I can access the information I need wherever I am	3,75 *	1,06	3,377 *	1,10
Workers can see other workers' electronic calendar	4,02	0,96	3,93	1,05
Workers can communicate with instant messaging tools (e.g. Skype)	4,62	0,65	4,62	0,67
My workplace has sufficient equipment for virtual negotiations	3,54	1,21	3,39	1,23
My workplace has electronic teamwork tools (like MS Sharepoint)	4,41	0,84	4,38	0,78
There are appropriate mobile devices available at my workplace (e.g. laptop, smartphone)	4,41 *	0,85	4,14 *	0,98
Scale: 1 = strongly disagree, 5 = strongly agree				
Statistical significance of the difference of the means: *** p<0.001, ** p<0.01, * p<0.05				

#### 4.6.3 Social work environment

Switching behavior was not influencing the experiences concerning the functioning of the social work environment but concerning the meeting practices switchers were more critical (see Table 4).

Table 4. Experiences of social work environment.

Variable	No switching (n=112)		At least one switch per working day (n=115)	
	Mean	SD	Mean	SD
I am able to work in the ways and at the times which suit me best	3,46	1,24	3,41	1,23
Telework is a generally accepted practice at my workplace	4,37	0,86	4,49	0,79
Operations at my workplace are open (e.g. decision-making and information flow)	3,38	1,11	3,20	1,12
Information flows well among the people important for my work	3,45	1,07	3,33	1,12
The meeting practices at my workplace are efficient	3,24 *	1,04	2,94 *	1,11
Our workplace has clear guidelines regarding the use of IT and communication tools	3,21	1,06	3,14	1,15
I have clear goals set for my work	3,59	1,10	3,42	1,15
My work is assessed in terms of results achieved, not only hours worked	3,66	1,14	3,72	1,04
My work tasks constitute a reasonable whole	3,83	1,08	3,74	1,05
New ways of working are actively explored and experimented at my workplace	3,11	1,15	2,91	1,13
Scale: 1 = strongly disagree, 5 = strongly agree				
Statistical significance of the difference of the means: *** p<0.001, ** p<0.01, * p<0.05				

Switchers and non-switchers did not differ in their experiences concerning the sense of community (see Table 5).

Table 5. Sense of community at work

Variable	No switching (n=112)		At least one switch per working day (n=115)	
	Mean	SD	Mean	SD
We have a good we-spirit in our work community	3,98	0,93	3,84	1,05
I get support and help from my work community when needed	4,12	0,92	4,08	0,99
I can trust my work community	4,02	1,00	4,03	0,99
We understand each other well	3,87	0,85	3,81	0,95
Scale: 1 = strongly disagree, 5 = strongly agree				
Statistical significance of the difference of the means: *** p<0.001, ** p<0.01, * p<0.05				

#### 4.6.4 Individual work practices

The biggest differences between switchers and non-switchers were related to the individual work practices. In several aspects concerning the individual work practices switchers were more advanced compared to the non-switchers. They were more active utilizers of technologies in their mobile work. In addition, they used more actively the possibility to choose quiet place to do the work requiring concentration and they closed down disruptive software. They were also more systematic advance planners of their daily working (see Table 6).

Table 6. Individual work practices

Variable	No switching (n=112)		At least one switch per working day (n=115)	
	Mean	SD	Mean	SD
I use technology (e.g. videoconferencing or instant messaging) to reduce the need for unnecessary travelling	3,83 **	0,96	4,17 **	0,91
I utilize mobile technology in work situations where I have to wait about (e.g. working on the laptop or phone in the train)	3,65 **	1,36	4,19 **	1,09
I try to manage my workload by prioritizing important tasks	4,21	0,80	4,38	0,72
I do things that demand concentration in a quiet place (e.g. in the quiet room or at home)	3,78 **	1,17	4,19 **	0,94
I prepare in advance for meetings and negotiations	4,05	0,80	4,04	0,85
I take care of my well-being during the working day (e.g. by changing my work position or the place I work in)	3,53	1,14	3,74	1,05
I follow the communication channels at my workplace	3,79	1,00	3,82	0,97
If necessary I close down disruptive software in order to concentrate on important work task	3,25 *	1,28	3,61 *	1,23
I regularly plan my working day in advance	3,10 *	1,15	3,58 *	1,08
I actively seek out and test better tools and ways of working	3,28	1,03	3,54	1,09
Scale: 1 = strongly disagree, 5 = strongly agree				
Statistical significance of the difference of the means: *** p<0.001, ** p<0.01, * p<0.05				

#### 4.6.5 Well-being at work

Experiences of wellbeing at work did not differ between switchers and non-switchers. In overall, the longer-term stress and difficulties to resolve conflicts at work were biggest obstacles in the work-wellbeing (see Table 7.).

Table 7. Work well-being

Variable	No switching (n=112)		At least one switch per working day (n=115)	
	Mean	SD	Mean	SD
I enjoy my work	3,98	0,93	3,97	0,90
I am enthusiastic about my job	3,79	1,00	4,03	0,89
I find my work meaningful and it has a clear purpose	4,07	0,97	4,10	0,90
My work does not cause continuous stress	3,26	1,19	3,07	1,26
My work performance is appreciated at my workplace	3,55	1,07	3,55	1,03
My work and leisure time are in balance	3,69	1,09	3,58	1,16
The atmosphere at my workplace is pleasant	3,94	0,90	3,78	1,02
Conflict situations at my workplace can be resolved quickly	3,17	1,07	3,12	1,13
Scale: 1 = strongly disagree, 5 = strongly agree				
Statistical significance of the difference of the means: *** p<0.001, ** p<0.01, * p<0.05				

#### 4.6.6 Self-assessed productivity

Whether one switches or not ones working zone during the work day was not related the different aspects of self-assessed productivity. In overall, respondents in both groups had most difficulties with the continuous stress caused by their work and in the resolving conflict situations in workplace (see Table 8).

Table 8. Self-assessed productivity

Variable	No switching (n=112)		At least one switch per working day (n=115)	
	Mean	SD	Mean	SD
I achieve satisfactory results in relation to my goals	3,99	0,92	3,98	0,79
I can take care of my work tasks fluently	3,88	0,95	3,93	0,95
I can use my working time for matters which are right for the goals	3,57	1,07	3,38	1,06
I have sufficient skills to accomplish my tasks efficiently	4,21	0,76	4,25	0,71
I can fulfill clients' expectations	4,03	0,80	4,01	0,77
The results of my work are of high quality	4,10	0,67	4,04	0,71
The group(s) of which I am a member work efficiently as an entity	3,68	1,00	3,50	1,00
Scale: 1 = strongly disagree, 5 = strongly agree				

Statistical significance of the difference of the means: *** $p < 0.001$ , ** $p < 0.01$ , * $p < 0.05$				
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## 5 CONCLUSIONS

The results of this study show, that in the governmental research site not all of the working zones of the activity-based office were used actively. The success of agreed behavioral norms regarding the use of different working zones was not perfect. The basic principle of utilizing different working zones for different work activities was not fully applied. A big share of employees did not switch their work station during the work day at all. Those who switch their work station at least once in a working day were more proactive planners of their work and they managed more actively their work environment. However, overall sense of self-rated productivity and work well-being did not differ between switchers and non-switchers. The results of the study also showed that overall sense of community is high among work communities, and the activity-based working does not seem to harm work community. In addition, various informal practices (both face-to-face and virtual) to maintain sense on community were applied actively.

## 6 DISCUSSION AND IMPLICATIONS

According to the results of this study, the core pain points in the application of activity-based working are the switching and appropriation of behavioral norms for the use of the shared work environment.

As a new result compared to earlier studies on work setting switching in activity-based office, this study showed that there were no significant differences in work well-being and self-assessed productivity between non-switchers and those who switch at least once a day their working zone. This differs from the results of Wohlers et al. (2019), who found out that job attitudes and vitality were more positive among those employees who used the variety of work environment zones appropriately. Also Haapakangas et al. (2018) reported higher productivity and better well-being among more active switchers. However, the results are not fully comparable, because both Wohlers et al. (2019) and Haapakangas et al. (2018) used different scales measuring well-being and productivity than was used in this study. In Haapakangas et al. (2018) the share of active switchers was higher than in this study. In this study the share of active switchers (at least one switch during the day) was 51% compared to the 72% in the study of Haapakangas et al. (2018).

An ABW change is newer only a change in physical work environment. It is from the employees' viewpoint change from the personal work station-based way of working to mobile, activity-based work, where work settings are switched and selected based on the quality of the current work activity at hand. To enable this change in the way of working to happen, various means to support the employees during the change need to be secured. Extensive training of the concept of activity-based working is needed, alongside with the participatory design of behavioral norms for the work in the shared work environment. The key to successful application of activity-based working is the employees' ability and willingness to switch ones' work settings during the workday, when work activity changes. As the results of this study show, the employees who already do switching have strong habits to plan their working day in advance, maintain proactively their ability to concentrate, utilize the resources the work environment provides and utilize mobile ICT in their work. In the future, more emphasis is needed to support the formation of these habits and work skills as part of the ABW implementation process.

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