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ARC2014-1231

Open-Plan Offices – Design and Psycho-Emotional and Health Aspects

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This paper should be cited as follows:

Open-Plan Offices – Design and Psycho-Emotional and Health Aspects

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Abstract

In this paper, we describe the results of a case study, which was conducted in open-plan offices in Bratislava. The case-study is aimed on perception of the current state and on the expectations of the employees in relation to their immediate environment. The topics discussed and the questions asked in the questionnaire, are focused on factors that can be improved by the interior design of the office and of the furniture. In this study, we recorded several remarkable factors. The significant factors, which the employees find important and where the current office reality do not meet their expectations are lightning; height of the desk partition; the box to support the legs while sitting at the desk; flowers and green; the possibility to mount posters or decorations on the workplace.

The employees in our case study prefer higher desk partition as they have currently. The preferred colors for desk partition are neutral colors as beige, ivory sandiness and pastel colors. The preferred material of the desk partition is fabric cover and cork.

Keywords: open-plan office, office, workplace, health, well-being, office furniture, Bratislava, desk partition, desk, material, color

Introduction

The indoor environmental health issue is a complex matrix of medical, psychological, and engineering issues. One of the building type with probably worst reputation among people are the office buildings. The mostly negative perception of open-plan offices is a worldwide known problem, and there is hardly a chance that they will be significantly eliminated in the next few years. The indoor environmental health issue is a complex matrix of medical, psychological, and engineering issues (O'Reilly, Hagan, Gots, Hedge, 1998).

In this paper we will introduce the results of the case-study performed among 51 employees in open-plan offices in Bratislava. The case study will serve as a basis for the design of several models of the office furniture units. We will take into account the results of this study as well as the results of other studies, which have been already performed. Most of these studies, unfortunately, did not focus on the furniture characteristics itself. Several model designs of the office furniture will be presented to the employees in diverse open-plan offices in Bratislava, so we can confront, correct and reconsider our model solutions. This part of our research is planned for the next 10 - 12 months.

Theoretical Background

Many of us spend in the office a lot of time and it is therefore necessary to create motivating, emotionally pleasant and positive work environment respecting the needs of individuals. The interior design influences the performance and the well-being of the coworkers. (Vinárčiková, 2012). The number of employees, who spend their common working day in different types of office, was already in 2005 alarming – for example in Germany in was approximately 16,3 milion employees (Eisele, Staniek, 2005). The open-plan office is especially important today with highly communicative office utilisation – e.g. with call centres (Ansgar, Eickhoff, 2013). Perform a concentrated work in large shared spaces have had a negative influence on employees health and wellbeing for over a hundred years ago. Already in the year 1901, in the report of the German Ministry of Post was mentioned, that about 17,9 percent of all illnesses of the attendants were nervous diseases caused by the concentrated work carried out in large shared spaces. (Lachmayer, Louis, 1998). The telephonist work changed over the time and currently the emotional skills and work feelings are gaining more importace in this kind of job implemented in open-plan offices (Keithley, Koskina, 2009). Of course, in the open-plan offices there are various type sort of jobs carried out. The next important point is the sitting position while working. This can be the most signifiant factor, why employees perceive their working enviroment as negative influencin their health and general mental condition. There is a simple looking solution of this problem, which is often furniture offering standing position, designed and produced nowadays. But the fact is, that

people can not live without chairs in their work and life, especially those people who need to spend more than 1 / 3 of their daily time sitting in chairs. (Qiu, Wu, 2008). The further investiagtion of the volitional standing while working could be interesting. In our pre-research, we found out, there is only marginal percent of employees interested in this posibility. The standing 'hot' desks apparently do not bring up benefits too, the volitional use of standing 'hot' desks did not alter overall sedentary work time in the sample of Australian employees working in open-plan offices (Gilson, Suppini, Ryde, Brown, Brown, 2011). Another important issue, which we will focuse on, is the lack of privacy as an unsolved negative aspect in open-plan offices. This issue was already indicated in previous study (Ding, 2008). The privacy was also specify as one of the three most important issues of the physical enviroment, among with lighting and ventilation, which has a noteworthy influence on emplyees satisfaction. The open-plan office occupants who were more satisfied with their environments were also more satisfied with their jobs, suggesting a role for the physical environment in organisational well-being and effectiveness. (Veitch, Charles, Farley, Newsham, 2007). An important literature review of studies dealing with the topic of open-plan office helped us also to understand the komplexity of this issue. The tremendous cost of human capital should be considered while designing the open-plan offices and the workspace needs of the workers should be considered as well (Roper, Juneja, 2008). Unsatisfactory is that the appearing phenomenon of unsatisfaction of the employees in the open-plan offices has an unclear origin, the concrete problems can't be defined. The important point, which also motivated us to concentrate on the open-plan offices, is that we can observe, that the bigger the office size is, the higher is the general dissatisfaction with the work (Amstutz, Kündig, Monn, 2010).

Methodology

The approach to the topic how we can influence the well-being and satisfaction of the employees trough new and more suitable design of the furnitere, especially the working station itself, focusing on the desk and desk partition, we decided in the first step for a pre-research. The pre-research method is review of a results of studies achieved so far and interviews with the employees. The second step was detecting the most important factors connected with the office furniture itself concerning the well-being, satisfaction and feeling of peace. These factors were summarized in the questionnaire. We asked the employees to filled the questionnaire physically, not as a online questionnaire, to increase the attention when answering questionnaires, as during the interview, we recognize a lack of interest on online surveys, questionnaire and online communication, which the asked employees referred as bothering. The next step of our research, not summarized in this paper yet, will be designing several virual design model of a working place in an open-plan office, based on the results of the existing research, and asking the

employees to evaluace these models, so we can determited the characteristic of the open-plan office furniture, which will intitiate and stimulate the employees and offer them the highest possible individualisation of their own workplace.

General Information

In our case study we have focused on satisfaction, needs and preferences of 51 employees working in open-plan offices in Bratislava. The case study was performed from January 2014 to March 2014. There were 23 male and 28 female employees surveyed. The average age of the female employees in this study was 27.24 years; the average age of the male employees was 28.66 years. We asked the employees to describe how long during the day do they deal with different activities in order to get a more accurate picture of the situation. Expressed in percentage, telephoning takes in average 19.57 percent of the working time; 60.665 percent are taken by silent activities as writing, planning, reading; 16.745 percent is taken by meetings off the working table; 3.02 percent goes to other activities, described by employees as breaks, project work, ad hoc projects, chatting with colleagues, etc. The average height of men in this study is 181.62 cm and average height of women is 168.14 cm, which is more than the average height of men and women in Slovakia, as measured the last time in 2004. In the future, we would like also investigate, if there are potential correlations between these characteristic of employees (age, height, activities, duration of the employment) and their satisfaction and preferences regarding the working place and regarding their own working desk. All 51 questionnaires and also the transcripts of the interviews with the employees, which served us as a part of a pre-research are available for the inspection at the author of this paper.

Case Study - Results

Negative Influence of Several Factors on Employees Satisfaction and Feeling of Well-being while Working

With help of our pre-reasearch, we were able to identify the most distracting factors, those, which are mostly seen as negative by the employees or are felt as a lack of certain equipment. We filter those factors, which are eventually possible to improve by the design of the office furniture and interior design. Those factors, which are connected with the building structure itself, as for example type of air condition, disposition depth, ceiling height, etc. were not included in the questionnaire, as those can't be influenced by furniture design. The two factors with the biggest negative influence on the feeling of well-being and satisfaction of the employees is the "Noise on the workplace which I can't influence" and "Static posture at work - I have a back pain, neck pain etc." (see Figure 1). Next very significant factors are "Insufficient work table area, lack of space for work itself and to store the equipment", "lack of

light, I can't individually regulate the lighting" and "lack of privacy, I need more privacy and peace". The notable negative impact on the overall employees' satisfaction and feeling of well-being while working includes also following factors: "disturbance by the colleagues while working" and "unsuitable table height".

Degree of Importance and Fulfilling the Employees Expectations of Several Factors Concerning the Personal Working Place

The next questions inquiry the importance of 12 factors concerning the feeling of well-being and if the current state meets the expectations of the employees (see Figure 2 and Figure 3). The two most important factors (both factors have been evaluated by 49 employees as important or very important) are the "height of the desk, adjustability of the desk" and the "workplace lighting, the possibility to regulate one's own lighting". The next important factor is the "height of the desk partition", "coat rack or hanger", "place to put a handback, luggage,backpack, etc.", " box to support legs while sitting at the desk", "flowers and greens and place for them", and the last of these important factors is the "possibility to place posters or decoration".

Figure 1. *The Negative Influence on the Overall Feeling of Well-being and Satisfaction while Working in the Open-Plan Office*
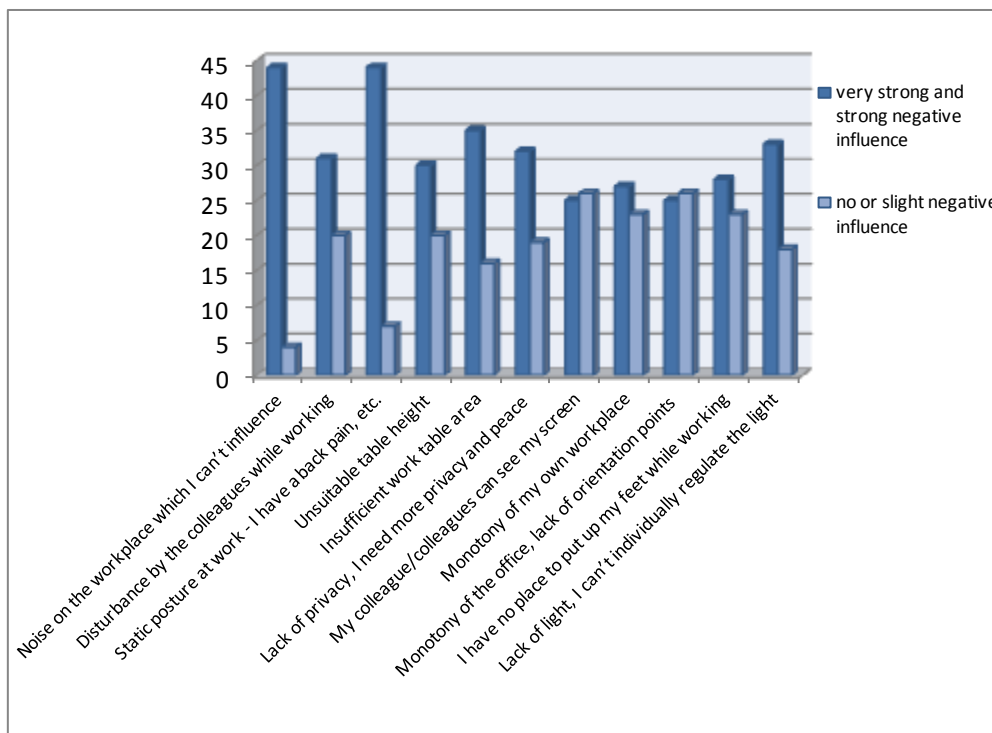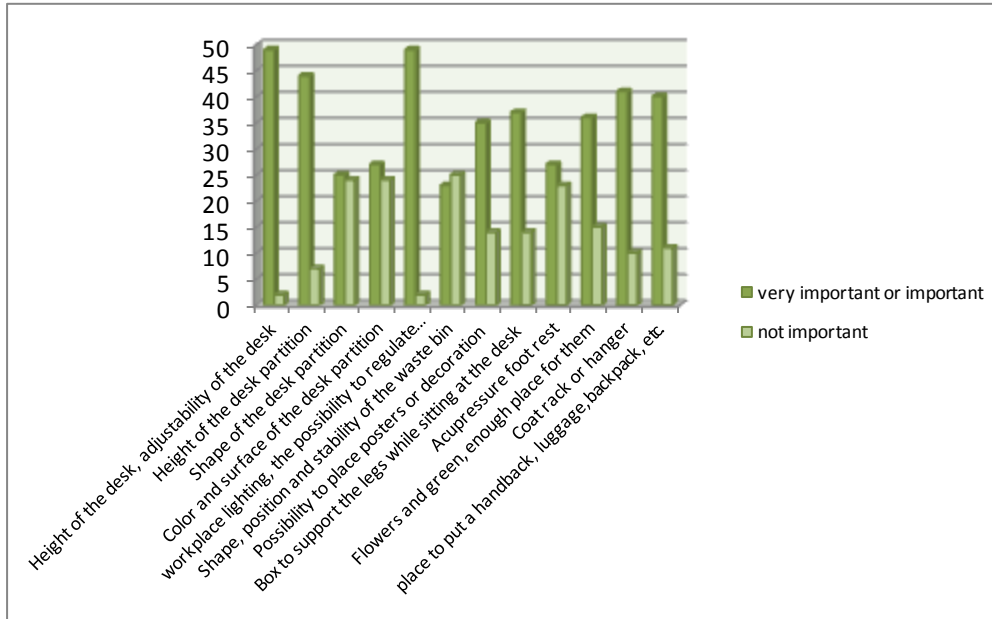
Figure 2. *The Importance of Following Factors According Employees Opinion*

When we look at the second part of this question: "Does the current state on your personal workplace meet your expectations?", and we concentrate only on the important factors, according to the employees opinion, we will notice that half of the respondents is totally satisfied with the "height of the desk, adjustability of the desk", but there are only 16 respondents who's expectations are totally fulfilled by the current state concerning the factor "workplace lighting, the possibility to regulate one's own lighting" (see Figure 3).

Figure 3. *The Fulfilled and Unfulfilled Expectations with Concrete Factors in the Current State of Personal Working Place in the Open-Plan Office*
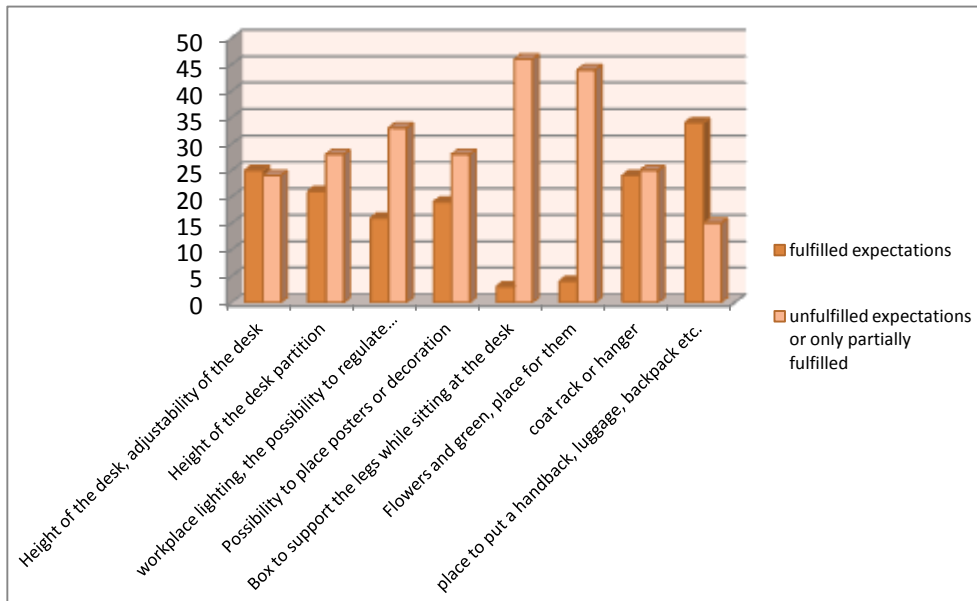
The rest is unsatisfied or only partially satisfied. Regarding the factor "height of the desk partition", there were 28 respondents whose expectations are not fulfilled or only partially fulfilled. The importance of "coat rack or hanger" was evaluated as fourth most important and almost one half of the respondents (24 respondents) think that the current state of their office fulfilled their expectations. More remarkable are those 46 respondents whose vision and expectations of "the box to support the legs while sitting at the desk" have not been fulfilled. The "flowers and green, enough place for them" factor does not meet taste and expectations of 44 respondents, which is also a very high number. The factor, "the possibility to place posters or decoration at the workplace", meets fully the expectations of only 19 people in the current state of the workplace. The factor "place to put a handbag, luggage, backpack etc." was evaluated as quite important, the expectations are also mostly fulfilled, so we can assume that there is not a strong need to extend the space for handbag or luggage in our future design models. (see Figure 3). The evaluation of this part of the questionnaire helped us to indentify the most pressing areas that can be improved trough better design of the working place and working station itself. The most significant is the lightning, height of the desk partition, the box to support the legs while sitting at the desk, flowers and green and the possibility to place posters or decorations at the workplace. Certain attention during the designing process has to be put also on height of the desk, adjustability of the desk and on the coat rack or hanger.

Employees Preferences of Color and Material on their Personal Workplace
According to our interview in the pre-research, we found out that the employees are often not satisfied with the colors of their working place generally. We can notice, as an example, that employees sitting on the desk with vivid red desk partition often refer this color as a source of nervosity and aggressivity. There is a big amount of studies dealing with impact of the colors generally, with diverse results (Bakker, van der Voordt, de Boon, Vink, 2013). In our study, we would like to see the color and material preferences of employees working in open-plan offices in Bratislava according to their personal working place. The color and material preferences can be evaluated and incorporated directly in the model solutions of the furniture design. Color and material preferences are apparently, according to our results, not as significant as for example noise in the workplace. In spite of this, the information gained from the answers to these questions is remarkable compared with the currently produced and sold office furniture. We are aware that the results of this case study have been influenced also by the cultural conditions; especially the color preferences can vary from country to country, city to city and culture to culture.

Figure 4. *Color of the Desk Partition – Employees Preferences*
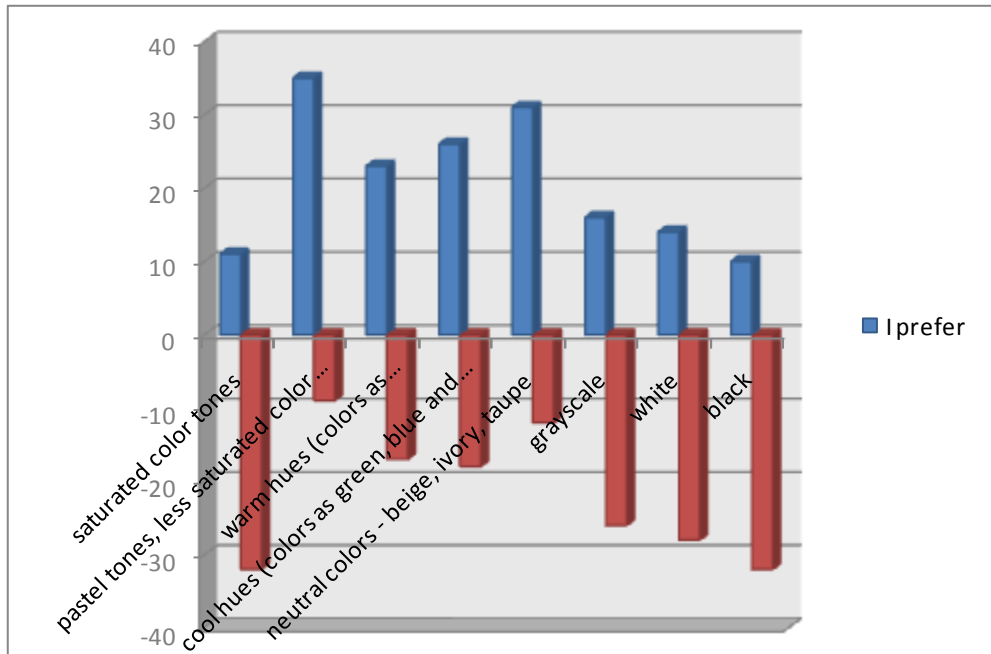
In our study, we found out, that the most preferred colors of the desk partition are pastel colors, less saturated colors and then the neutral colors – beige, ivory, taupe, etc. (see Figure 4). The least preferred colors of the desk partition are saturated colors and as expected, the black. The office furniture producers were apparently trying to break the common perception of the grayscale offices by using vivid colors in the last years. This strong denial of the gray in the offices has brought the employers the idea, that using vivid, saturated colors, not only as desk partition, but also on the walls and carpets can create more friendly working environment. Based on this case study we can say that nowadays the colors preferred by the leading office furniture producers do not meet the expectation of the employees working in the open-plan offices. The most preferred surface material of the desk partition is fabric, followed by cork. Upholstery is the third most preferred material for the desk partition (see Figure 5). The least preferred surface materials are imitation of wood, laminated foil and plastic.

Figure 5. *Material of the Desk Partition – Employees Preferences*
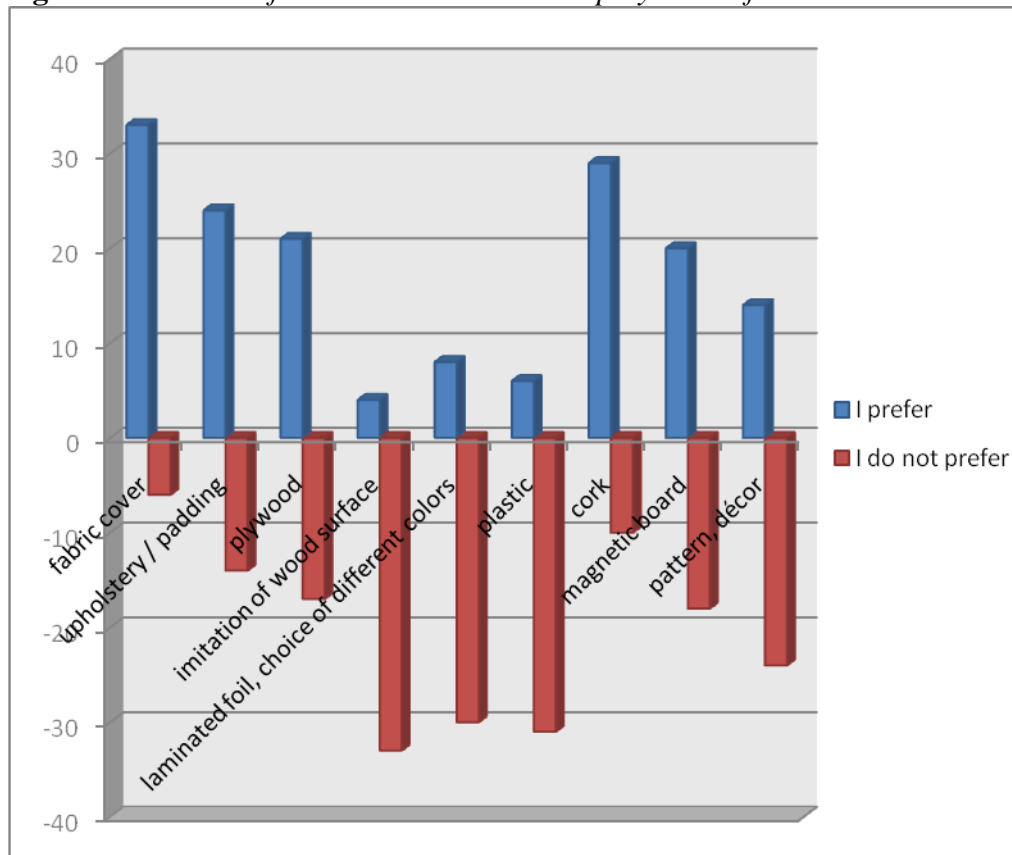
These results show that the employees prefer materials soft to the touch and natural materials. They indicate that the employees need more coziness and are not satisfied with the haptic properties of the materials used in their current immediate working place. Regarding to the desk, we asked about the color preferences only, the material was not the object of our inquiry, because several qualities are required, as for example smoothness and firmness of the desk surface. As expected, the most preferred colors for the desk are neutral colors – beige, ivory, taupe, etc. The second most preferred are pastel colors. As expected, the least preferred table desk color is black and the second least preferred are the saturated, vivid, colors.

Employees Preferences of the Height of the Desk Partition

One of the results of our study, which we want to present in this paper refers to the height of the desk partition since this has been identified also in our pre-research as a remarkable issue. We asked the respondents to choose the current state on their own workplace from 5 possibilities - 4 schemes and the choice of no desk partition. This last possibility was under choice e) "we do not have desk partition". (see Figure 6). In the next part of the question, they were to choose which of these schemes, where the desk partition height was displayed, would they prefer to have on their own workplace. We can see that the employees prefer higher desk partition between two desks as what they

currently have (see Figure 7). The need to be separated from the others is legible. The next interesting question for further additional studies will be to find out whether these preferences remain the same during different activities at work (telephoning, silent activities, etc.), during the day working in the open-plan office (morning coffee and chatting with colleagues, lunch break, difficult tasks, late working hours etc.) or they are the same during the whole working hours.

Figure 6. *Desk Partition Height – Question Regarding the Current State and Regarding Wished State of the Desk Partition – Excerpt from the Questionnaire*
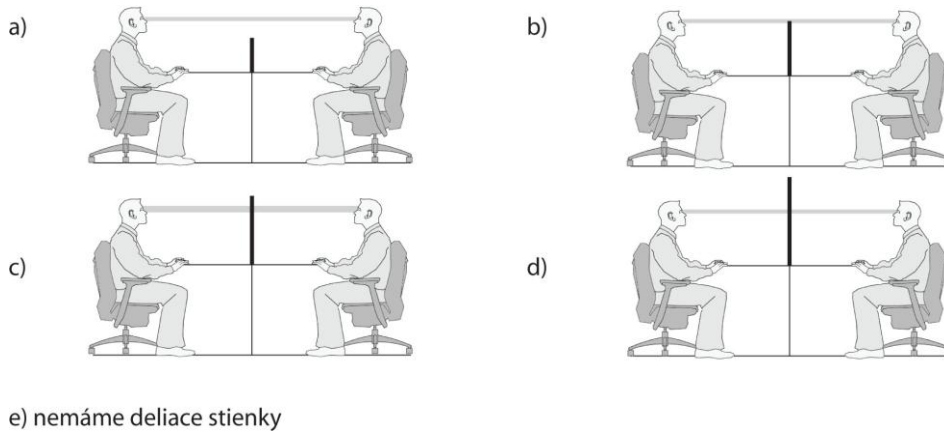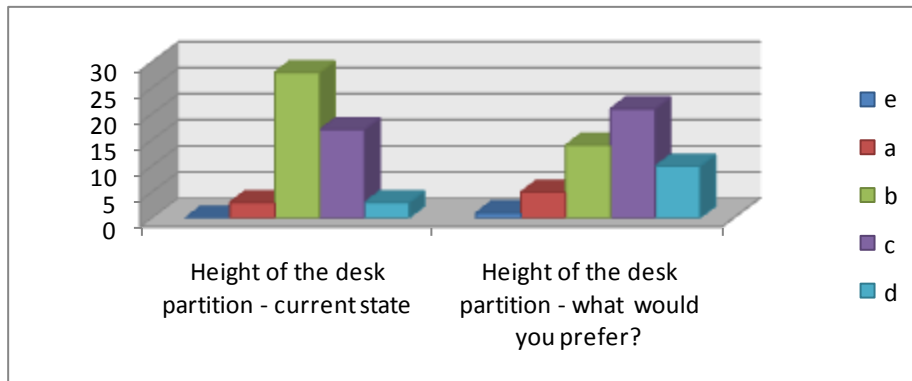

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Figure 7. *Material of the Desk Partition – Employees Preferences*

Employees Perception of the Impact of the Working Place on their Health and Mental Condition

The last point of the questionnaire that will be discussed in this paper is the employees perception of overall impact of their workplace on their health and also on their mental condition. The majority of the employees hold an opinion, that the impact of their working place on their health is strong. Thirty nine respondents think the impact is strong and 11 think the influence is moderate. Comparable results can be gained also by the question: "How big is the impact

of your working place on your mental condition?" Thirty five respondents think the impact is strong and 14 think the influence is moderate.

Conclusion

The most important information for the future research and the design of the models are the color preferences of the desk and desk partition - the employees prefer neutral colors as for example beige, ivory, taupe, excluding grayscale, black and white and also the pastel. The material preferences of the desk are showing us the tendency to natural materials and importance of haptic properties of the materials used in their working place. One of the very important facts concerning the desk partition is the preference to choose a higher desk partition, this can indicate the need to separate from the coworkers and as already mention the resisting lack of privacy in the open-plan offices. The two most significant factors with negative impact on employees' wellbeing are the noise at the workplace and the static posture at the work. We will focus on these factors in our design, as we are see the possibility to decrease this negative impact trough a confident, adjustable design of the office furniture.

The next factors where the employees are not satisfied with the current situation is the desk partition height, lighting, lack of support for their legs while working and longing for more green in the office. We can also infer, that the important employees needs is to connect trough the material, colors, flowers and green in the office with the nature itself. The employees' demands are also more silence, privacy, adjustability of the furniture and lighting. We will incorporate these demands to our future models of office furniture. The limitation of the paper is that the sample is small. Future studies are needed to further investigate diverse subjects in a larger population.

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