

IMAGE OF ORNAMENTAL PLANTS IN WORK ENVIRONMENTS AND THEIR EFFECT ON EMPLOYEES

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Abstract. Introducing elements of nature in indoors has many benefits on employees, due to the fact that people spent most of their time in enclosed spaces, such as offices. Integrating ornamental plants into indoor environments can be considered a health promotion tool, a low-cost and an effective method for increasing commitment to nature in a world largely urbanized. For this study a questionnaire was developed and applied in a unit in Cluj-Napoca with administrative purposes and with cross-disciplinary activities to determine employees' perceptions on the image and the effects of plants in the workplace. Questionnaire 'Image of plants in the workplace and employees comfort at work' with 34 direct and concise questions and demographic data reported results that support the hypothesis that plants in workspace presents sanogenetic characters. Thus, it appears that employees would like to have more plants in the workplace (97%) because provide a sense of relaxation (97%), change the work environment making it similar with space from home (98%), cheer up the image of an office (99%) and give a sense of relief (98%). Approximately 98% of respondents believe that ornamental plants raises work motivation.

Keywords: work environment, plants, perceptions, employees, comfort, benefits.

INTRODUCTION

Rapid urbanization has led people to spend 80-85% of their time in indoors (Soreanu *et al.*, 2013). According to various studies building is a complex and dynamic entity that consistently respond for their occupants and their activities (Bachman, 2004).

The major factors that contribute to indoor air pollution and the level of discomfort it is represented by the combination of chemicals, physical stressor such as temperature and humidity, but also microorganisms (Ndwiga *et al.*, 2014). Nowadays internal environment is considered as an important determinant of health and well being of building occupants.

People react in different ways to the indoor environment. Modern office environment is very complex and produce to the occupants physiological (biological conditions) and psychological reactions like perception, mood state (Kamaruzzaman and Sabrani, 2011) and also different physical characteristics of environmental conditions. A working environment is considered better than another from various complex reasons such as social as well as psychological aspects of activities in the workplace, but involve also physical environment.

Traditionally this has been the management area, but nevertheless stands out that physical and psychological environment are not separate entities, but rather parts of an integrated experience which reinforces the fact that horticulturists, landscape architects, economists, psychologists, ecologists, engineers, scientists and doctors must maintain close links between their disciplines.

Most persons responsible for buildings and their interior design and management agree that plants contribute to environmental quality. Many studies show that the natural environment in a variety of settings appears to be an important determinant of how people think, feel and act. Human attitudes, behaviors and physiological responses can be changed by both passive and active interaction with plants (Keniger *et al.*, 2013).

An interior space is more pleasant and attractive when ornamental plants are part of the setting because they add personality and beauty throughout the year creating a colorful atmosphere, relaxing but also human working environment and increase employee productivity which is the fundamental component of a company's success in the contemporary competitive world (Yeow *et al.*, 2012). Employee productivity in the work environment can be reduced by a high level of stress. A space with natural elements such as vegetation, plants and leaves minimizes the negative impact of stress at work (Largo-Wight *et al.*, 2011). The design office has a direct correlation with optimum performance at work, and a competitive advantage for companies. Company managers who ignore interiors design and appearance fail to optimize the value of human capital (Beautyman, 2006).

A good workplace design is very important because it puts great emphasis on satisfaction, attraction; motivation and retention of staff (Bodin-Danielsson, 2010). Also, its importance influences the degree of creativity and innovation of employees, how they respond to business and technological change.

Likewise, ornamental plants perform other functions besides the aesthetic and improvement of indoor air quality. These include driving or pedestrian traffic control, dividing the space into separate areas or annexation (Figure 1), the reduction of reflection from bright lights and screening to block unwanted views or to create intimacy.



Figure 1. Different functions of ornamental plants in the workplace

Employing elements of nature indoors has many benefits. Integrating nature into indoor environments can be considered a health promotion tool, and an effective method for increasing commitment to nature in a world largely urbanized.

The present study aimed to investigate the image and the effects of ornamental plants in a work environment on space and on representative occupants.

MATERIAL AND METHOD

Selection of indoor setting to be included in this research was of fundamental importance and the most important criterion was that ornamental plants to be present in the building and the sampling was done on purpose, taking into account the following considerations:

- Persons selected to be employed by the unit chosen for the study;
- To represent demographic the population in the workplace;
- To have availability;

- To be of the opposite sex.

For this study a questionnaire was developed and applied in a unit in Cluj-Napoca with administrative purposes and with cross-disciplinary activities to determine employees' perceptions on the image and the effects of plants in the workplace. As data collection method was used online questionnaire with 34 direct and concise questions with positive and negative character, also included demographic data (Table 1).

Table 1

The questionnaire design with 34 statements for each a five-point Likert scale answer

Statement	Scale				
No.crt	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Totally Agree
1. The workspace is small	√	√	√	√	√
2. I would like to be more plants in the workplace					
3. Plants cheer the image of an office					
4. Plants help to improve productivity and the identity of the personal space					
5. Ornamental plants at work raises motivation					
6. Ornamental plants bothers me					
7. Ornamental plants make the workplace to look small					

Note: √ represent the choice of the respondent regarding how much disagree-agree with the statements included in the questionnaire

The evaluation was performed by five scale responses as shown in the table 1.

As a first step in conducting the research was necessary to obtain permission to ensure appropriate access in the unit. As the initial phase the management department was contacted for permission to conduct this study in their institution and was set face to face meeting, where it was described the study and its purpose. At this level it was given permission to perform and to involve employees in the study. After this stage it was fixed a meeting with the staff to explain the purpose of the study, its phases and their involvement in the project, confidentiality and to request their agreement to participate voluntarily. The questionnaire was sent by e-mail to the administrative unit which distributed it to the employees. Participation was anonymous, and respondents had the opportunity to give up whenever they wanted. Thus, the study was conducted with 152 subjects with age ranging from 20 to 60 years. The data were interpreted using Wilcoxon Signed Rank test. Due to the fact that the value of W was 20.5, average 30.09, and the distribution was normal, it was passed by data interpretation of the Z. test. The value of Z (-4.8) was significant for $p \leq 0.5\%$.

RESULTS AND DISCUSSION

The results of this study are consistent with the hypothesis from which was started, namely as ornamental plants in work environments shows sanogenetic characters, by

comparing values of χ^2 calculated with values of χ^2 of Annex 8 (statistics book) which highlights that deviations from expected results are insignificant for $p \leq 0.05\%$.

The results demonstrate how employees perceive the environment and the effects of plants (Figure 2).

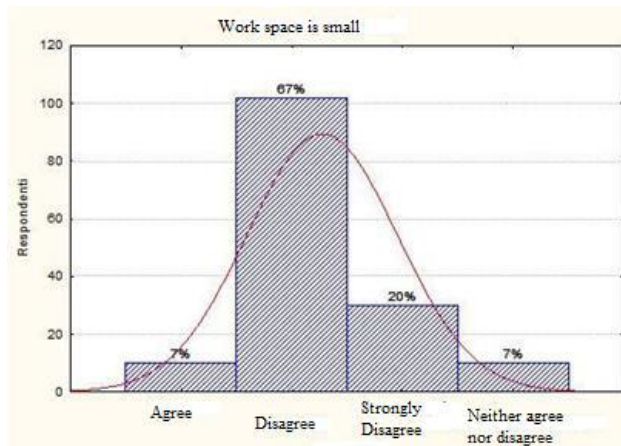


Figure 2. Results of the size of the space perceived by respondents

When asked if the size of the workspace is small, 67% of respondents answered disagree, 7% of them replied to the agreement, 20% responded strongly disagree, and another 7% said neither agree nor disagree. Thus, it can be concluded that participants in the study are satisfied with the size of the working space. As noted by many authors, office design with the layout and size is an important factor in job satisfaction and has a substantial impact on the employees' productivity (Hameed and Amjad, 2009).

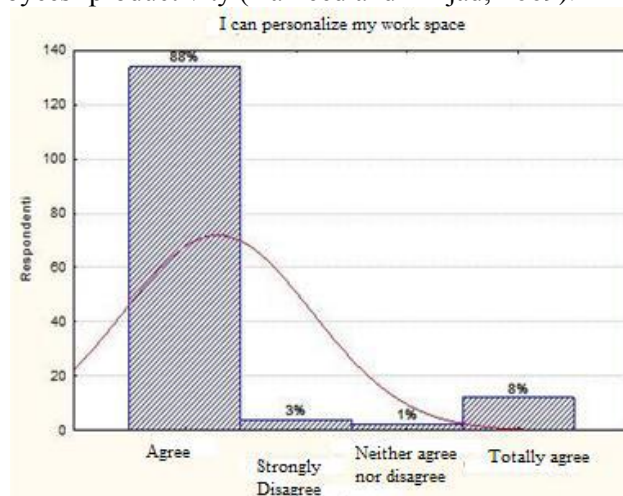


Figure 3. Results on permission to personalize the space perceived by respondents

At the question 'I can personalize my working space', 8% of respondents answered that they were completely agree, 88% of them replied that they agree, 1% of employees are indifferent responding neither agree nor disagree, and the remaining 3% said they strongly disagree (Figure 3). From the answers given by the participants it can be observed that management unit gives employees the ability to customize the space in carrying out the work, so they feel more comfortable at work and hence productivity can grow.

The study results show that in the working space the perceived image of plants is good, and 78% of employees consider factors such exposure to the nature is a constituent element of productivity growth (Figure 4).

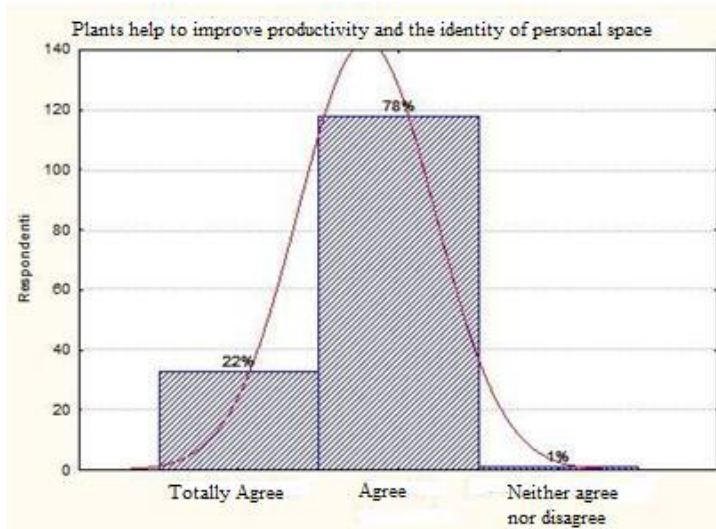


Figure 4. Results regarding the improving of productivity by plants

Moreover, the results suggested that employees believe that contact with nature experienced in the office or workplace can promote well-being in many ways: improving mood giving a sense of revival and refreshment (69%) (Figure 5), stimulates the senses provides a sense of relief (76%), relaxation (81%) (Figure 6) lift the motivation (85%) and appreciation of perceived space (79% rated the workplace as comfortable, 69% that plants improve the image of the work space (Figure 7) and 74% that cheer up the image of the office (Figure 8).

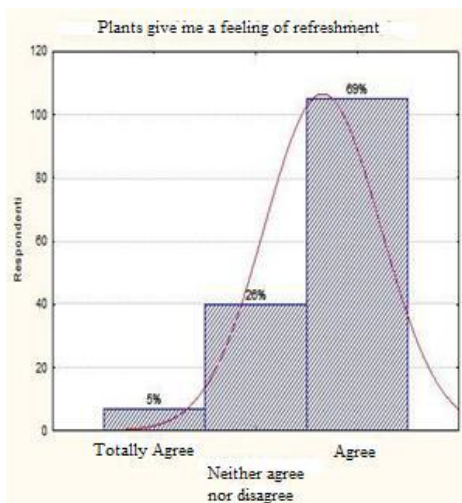


Figure 5. Results on the feeling of refreshment offered by plants

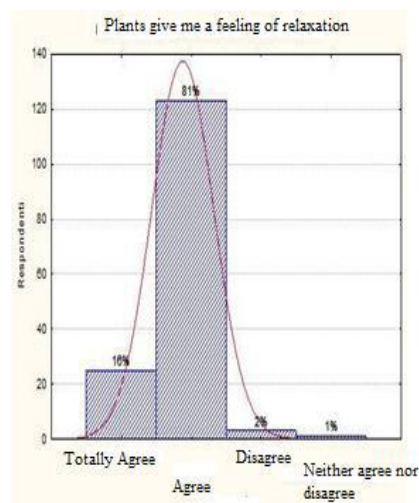


Figure 6. Results on the feeling of relaxation offered by plants perceived by respondents

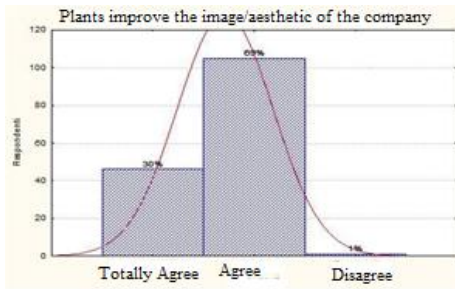


Figure 7. Results on the respondents perception on the fact that the plants improve company image

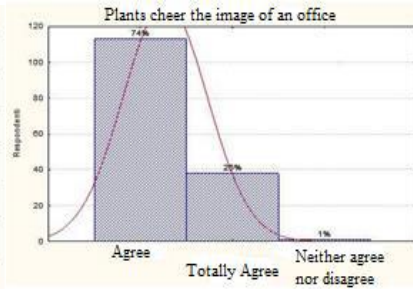


Figure 8. Results on the respondents perception on the fact that the plants cheer the office image

The employees have shown that they are interested in using plants as elements of air purification, knowing (89%) that the plants have clean up properties and reported a common trend to have more plants in the office (77%) (Figure 9), although the percentage of 85% have plants present in the office.

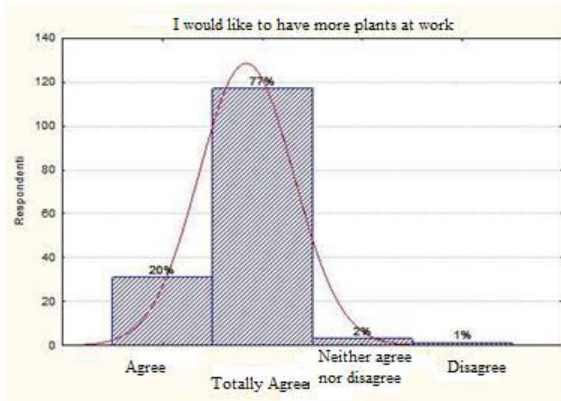


Figure 9. Results on the pleasure of having more plants at work perceived by respondents

Respondents answered that plants arrangement is useful in the work environment (99%) and that plants do not bother them (64%) nor do they consider as obstacles (69%).

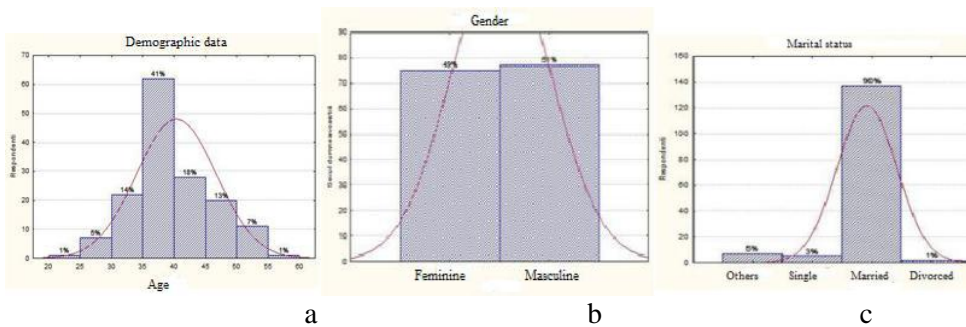


Figure 10. Results on age (a), gender (b) and marital status (c) of respondents

Analysis of socio-demographic data from this study shows that this questionnaire distribution by age of respondents is varied so that replied employees fall within the ages between 20 (1%) and 60 (1%), the majority respondents between 35-40 years of age (41%) (Figure 10 a). Most respondents are married (90%), 5% answered with others, 3% and 1% are themselves divorced (Figure 10 b). The study involved a total of 152 people, of which 51% were male, and a 49% lower number of female (Figure 10 c).

These results reveal that the plant reporting is not gender specific. The growth of plants in the workplace can be a symbol of appreciation for nature that can act as a useful reminder to keep in touch man - natural environment.

CONCLUSION

The way in which employees interact at work, collaborate, and fulfill their tasks are influenced by the physical environment. Also, the physical environment as an aspect of the working environment affects the welfare, satisfaction levels and thus overall productivity and individual workers. Workplaces today are diverse and constantly changing, so are an integral part of employee perceptions of workplace satisfaction. This study is based on work and contributes to it regarding the employee perceptions on plant image and their effects to offer psychological and perceptual benefits in indoor spaces.

Ornamental plants in work environment are very important because improve not only the atmosphere (comfortable, cheer up the image of the office and unit) and the psychological well being, such as relaxation, motivation but also the indoor air quality.

Obtained data indicates and supplements the results of other researchers concerning the significance of having elements of nature in the workplace for the employees and the company. This can be explained by the fact that people react to plants in three ways: a physical/physiological response, emotional response and cognitive response (Bakker 2009 quoted by Beliën, 2013).

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