

Individual Control over the Physical Work Environment to Affect Creativity

Sanaz Ahmadpoor Samani*

Faculty of Management and Human Resource Development, Universiti Teknologi Malaysia (UTM),
Johor, Malaysia

Siti Zaleha Binti Abdul Rasid

International Business School, University Teknologi Malaysia, Johor, Malaysia

Saudah bt Sofian

Department of Management and Human Resource Development, University Teknologi Malaysia,
Skudai Johor, Malaysia

(Received: August 20, 2014 / Revised: December 19, 2014; February 21, 2015 / Accepted: March 9, 2015)

ABSTRACT

The purpose of this paper is to provide a review of the background information regarding to the impact of personal control over the physical work environment on satisfaction with work environment and creativity at work. Today creativity has a significant and special place in business especially in innovative organizations which need creative people to generate new, and useful ideas for produce new products, services, work methods, systems etc. Moreover the design and appearance of workspace and individual ability to control the ambient conditions of the workplace have significant effect on their behavior, satisfaction and overall outcome including creativity. So the result of this study will contribute towards enhancing the understanding of the effect of office design to enhance employees' creativity.

Keywords: Creativity, Work Environment, Open-Plan Office, Personal Control, Satisfaction with Work Environment

* Corresponding Author, E-mail: sanaz.ahmadpoor@gmail.com

1. INTRODUCTION

Work plays a prominent and consequential role in people's lives. People have to work in places which surrounded and designed by many environmental elements and physical aspects that influence their ability and desire to work every day. In general, the majority of them spend at least 50% of their time within an indoor physical environment that affects their thoughts, emotions and actions. Studies in social and environmental psychology have established that the quality of the physical environment have a critical effect on people's attitude and performance (McGuire and McLaren, 2009; Vischer, 2007; De Croon *et al.*, 2005; Lee, 2007). Previous studies in the field of creativity also mentioned the role of

the physical work environment in affecting creativity (McCoy and Evans, 2002; Oksanen and Stähle, 2013; Vischer, 2007; Vithayathawornwong *et al.*, 2003).

In fact creativity has always been at the heart of business to gets new businesses started and that maintains the best companies after they have reached to the global level. Innovation and creativity are essential for organizational growth and economic development. Organizations must continuously develop new products and/or services that are successful in the market to ensure their survival. The success of a new product depends on many factors including organizational strategy, organizational characteristics such as the firm's organizational climate, characteristics of new products, the process of product development, and product market (Dul

and Ceylan, 2014; Landry, 2012; Ward, 2004). Moreover, the environment of the workplace that stimulates employees' creativity is normally believed to be helpful for creation of novel products.

Regarding to above explanation and based on prior studies creativity refers to any novel and appropriate activities and performance in any domain of human activities including business, management, scientific discovery, social interaction, painting, writing, and raising children (Amabile, 1996; Edelson and Malone, 1999; Gurteen, 1998; De Stobbeir *et al.*, 2011). It also refers to the process of creating novel ideas, services, and finding solutions for problems (Amabile, 1996; Amabile and Pillemer, 2012). Individuals' creativity is the creation of new and potentially useful ideas for producing novel and original products, services, processes, new solutions to related problems, etc. (Amabile, 1996). As suggested by prior studies supportive work environment can enhance people's creativity and people working in an environment which support creativity create ideas that are useful for product innovation (Moultrie *et al.*, 2007; Slijkhuis *et al.*, 2013; Vithayathawornwong *et al.*, 2003). "Creativity is considered as an antecedent of innovation" (Dul and Ceylan, 2014) (p. 1); because as suggested by Amabile *et al.* (1996) "all innovation begins with creative ideas" (p. 1154). Creativity has, been a focus of many academics in fields ranging from anthropology to neuroscience, and has attracted management studies as well. However, until now creativity hasn't been or may slightly notice in psychological, ergonomic and organizational studies to find out the relationship between individuals' expectation from the workplace design to affect creativity. Personal control over the physical work environment is one of the expectations of employees within the workplace which seems difficult in some types of workplaces.

Previous studies emphasize the importance of office workers' ability to control their physical work environment and focus without any distractions in their workspace (Roelofsen, 2008; Jahncke, 2012; Banbury and Berry, 2005). Personal control over the workspace can reduce the negative effect of distraction from the work environment (Lee and Brand, 2010) and enhance satisfaction with both work environment and job (Paciuk, 1990; Sundstrom *et al.*, 1994; Lomonaco and Miller, 1997). It is also suggested that while individuals' have better control over their indoor working environment as well as over lighting, temperature and ventilation, they reported higher productivity, greater connection and involvement with the work (Hua, 2010; Huang *et al.*, 2004; Roelofsen, 2002).

Moreover, current work environment is considerably different to what it was several decades ago; man-made objects dominate the physical surroundings and the tendency to move from private offices to open layout is increasing as well. The concept of office location refers to the place in which office workers perform their activities while the concept of office design refers to the

arrangement, design and type of boundaries within an office room (De Croon *et al.*, 2005). On the other hand, the concept of office use refers to the way in which workplaces are allocated to office workers. For instance, in some cases one single workstation may be given to one single office worker (fixed workplace) and in another situation one workstation may be allocated to a number of office workers (desk-sharing). Basically, there are two fundamental reasons behind the tendency of developing and using open-plan workspaces. The first reason is financial which relates to the idea that many employees can be placed in a giant space, so the workspace can be used more effectively. The second reason refers to the notion that open-plan solutions increase communication among co-workers, promote knowledge sharing, creativity and support teamwork (Hua, 2007; Brennan *et al.*, 2002; Hwang and Kim, 2013).

Despite their advantages and being one of the most popular forms of office designs among group projects with routine tasks, and creative and innovative industries, open-plan offices have its shortcomings. Compared to private offices, the amount of environmental distraction in open-plan offices are higher and more such as excessively noise, lack of privacy, presence of others, increased workloads, social setting problems and ambient conditions (Baldry and Barnes, 2012; Duval *et al.*, 2002; Jahncke *et al.*, 2011; Rashid *et al.*, 2009; Banbury and Berry, 2005; Roelofsen, 2008). These problems and distractions are often suggested to reduce the end-users' satisfaction (both environmental and job satisfaction) (O'Neill, 2008; Lee and Brand, 2005), enhance physiological stress (Rasila and Rothe, 2012; Lee and Brand, 2010), reduce outcome including productivity and creativity (Davis *et al.*, 2011; Elsbach and Pratt, 2007; Hua, 2007; Sundstrom *et al.*, 1982; Davis, 1984; Carnevale, 1992; Baldry and Barnes, 2012; Lee and Brand, 2010; Miller, 2005) and increasing desire to work in private rooms (Lee and Brand, 2005).

Therefore, the level of satisfaction with the environment among people occupying open-plan offices is lower than people occupying closed or private offices based on the above mentioned problems (Brennan *et al.*, 2002) which may affect people creativity at work. Previous studies indicated that there is a significant relationship between individual well-being and creativity (Shalley *et al.*, 2000). As indicated by prior studies positive mood plays a significant role in relationship between work environment and employees' health, safety, productivity and creativity (Fredrickson and Branigan, 2005; Harter *et al.*, 2003; Shipton *et al.*, 2006; Waugh and Fredrickson, 2006; Amabile *et al.*, 2005). Previous studies also have supported the concept of positive emotion to enhance satisfaction, motivation and productivity at work (Martin, 2005). Consequently, the purpose of this paper is to review of the background information regarding the positive impact of personal control over the physical work environment on employees' satisfaction with work environment and creativity at work by focusing on open-plan office arrangement.

2. THE ROLE OF WORK ENVIRONMENT DESIGN ON INDIVIDUAL ATTITUDE AND EFFICIENCY

Normally, offices are the daily reality of work for the majority of the population in most societies. Office employees often spend more than 40 hours per week at their workstations; therefore, the office environment plays a significant role in the daily life of a large number of people. The question here is: How can a building influence its occupants' attributes and working behaviour such as their ability, motivation, and performance? The answer is in a study by Heerwagen (2000): a building can positively affect one's ability by providing comfortable ambient conditions or by enabling the individual to control and adjust environmental features and conditions and by reducing health and safety risks. A building can also negatively affect an individual's attributes through uncomfortable, distracting, and dangerous environments. So, a building or physical environment can provide a situation to encourage and enhance positive and effective performance, personal control, and psychological engagement.

In fact, in order to provide an efficient and healthy workplace there are several critical issues to consider. Some of these issues as suggested by Di Martino and Corlett (1998) include the workspace itself (working zones, lines of sight, work heights); clearances (the amount of activity and movement in workspace); workspace layout and design (display and control over the locations and relationships); and the physical environment (lighting, noise, climate, and freedom). The physical features of a workplace have an impact on employees' satisfaction, productivity, and effectiveness. The physical structure of a workplace can be specified as the architectural design and physical situation of furnishings in a building that influence, control or adjust social interaction. Evidences which come from previous studies emphasising that employees may waste their time and energy trying to manage and adapt to a poorly designed work setting. However, employers are increasingly concerned that their employees have to spend their time and energy at work and relationships rather than in coping with poor or uncomfortable workspace conditions (Vischer, 2008; Roelofsen, 2002).

Previous studies from different perspectives have shown that the perceived quality of the physical work environment have influenced in employees' job perception, satisfaction, psychological stress, attitudes and overall performance (Sundstrom *et al.*, 1994; George and Brief, 1992; McGuire and McLaren, 2009; Thatcher and Milner, 2012; Vischer, 2007; Huang *et al.*, 2004; Hwang and Kim, 2013; O'Neill, 2010; Carlopio, 1996; Al-Anzi, 2009; Hua *et al.*, 2011; Davis *et al.*, 2011). Briner (2000) suggested that the nature and arrangement of designing and furnishing a place influence the frequency and type of interaction that takes place in an environment. Hua (2007) in his study summaries some

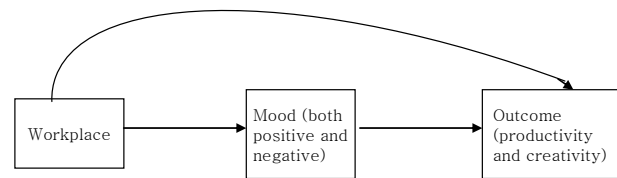


Figure 1. The impact of workplace on employees' creativity via mood.

factors which have been studied in the existing literature about the workplace, including workspace factors' categories, individuals' experience, outcomes, and so on. As mentioned by Hua (2007) it is considerable that majority of variables in the literature refer to features of individual workspace's such as accessibility, workspace size, etc., and most studied variables related to perception and outcome are focusing on individual office workers' experiences. Also the interpersonal experience factors are examined with regard to observing the relationship between individuals and their needs.

Workplace environment has several layers of meaning and value. Even if the workspace itself does not create any actions or behavior, overall it may facilitate or reduce desired and preferred behaviors and influences the users' energy and time which is spent in doing tasks (Hua, 2007). Obviously, good-looking surroundings may positively affect participants' level of well-being. Previous studies indicated the positive effect of good-looking workspace on employees' well-being, productivity and creativity (El-Zeiny, 2012; Hua *et al.*, 2011; Newsham *et al.*, 2004; Niemelä *et al.*, 2002; Thatcher and Milner, 2012). For instance, as suggested by Larsen *et al.* (1998), the existence of indoor plants increase the attractiveness and comfort of office environments. In the same vein, Shibata and Suzuki (2004) indicated the positive role of using plants on employees' creativity.

In fact, a vital role within an organization belongs to people, not machines. People are the vital component of the system and this applies to management and the organization and to the interaction between them and their total work environment. Consequently, the physical environments that employees experience in office buildings affect employees' well-being, satisfaction, and efficiency. In this regard, work environment should be designed in a way that motivates people who work within it towards better behaviour and outcomes. Moreover, the work environment can be understood as a motivation domain with particular stimulus characteristics that enables and permits some behavioural patterns to take place while limiting others (Carnevale, 1992).

3. THE ROLE OF PHYSICAL WORK ENVIRONMENT ON INDIVIDUAL AND ORGANIZATIONAL CREATIVITY

There are huge numbers of studies that have been

focused on the relationship between personal characteristics and creativity during the last 50 years. In summary, these studies have been indicated that, some factors as well as personality (e.g. openness, broad interest, toleration of ambiguity), cognitive style (e.g. divergent thinking, problem solving), knowledge (e.g. domain knowledge, broad knowledge), and intrinsic motivation (task motivation) are positively related to worker creativity (Amabile *et al.*, 1996; Shalley *et al.*, 2004). However, people's creativity is not only dependent on their characteristics and personality, it also depends on their work environment (both social and physical) and human resource (HR) practices to support and promote that. So, a supportive social and organizational environment can enhance a worker's creativity this fact is also supported by "componential theory model" (Amabile, 1998) and "Interactionist" model (Woodman *et al.*, 1993). For instance, Amabile (1996) explained that physical workspaces which were designed to be motivating can promote the level of creativity; however this effect is not stronger than other aspects of the work environment such as social environment.

Previous studies from different perspectives have shown that the perceived quality of the physical work environment influence people creativity (see for example: McCoy and Evans, 2002; Vithayathawornwong *et al.*, 2003; Vischer, 2007; Oksanen and Ståhle, 2013). In fact, previous studies indicated the direct or indirect role of certain features of the physical work environment on creativity via mood (Hedge, 1982; Larsen *et al.*, 1998; Shibata and Suzuki, 2004). For instance, Larsen *et al.* (1998) indicated that using plants in office design can improve people's positive moods; Shibata and Suzuki (2004) specified that using plants at work can enhance people's positive mood and creativity as well. Hedge (1982) indicated the role of windows in the workplace to enhance employees' creativity. The existence of windows within an office room refers to the existence of natural light and makes the place brighter, and the outside viewing. Outside viewing from a window may create a positive mood (Hedge, 1982) and encourage creative task performance (Shibata and Suzuki, 2002). McCoy and Evans (2002) in their study also suggested that visual complexity (presence of many objects and furniture) can motivate creativity and enhance social interaction in a workplace, but, some other studies opposed these findings and suggested that crowded places may decrease privacy and negatively affect social interaction and creativity (Stokols *et al.*, 2002; Sundstrom *et al.*, 1982).

Moreover, the creative behaviour of employees is not only affected by physical work environment or social work environment, the whole work environment which is formed by the collaboration and interaction between the social-psychological work environment (SWE) and the physical work environment (PWE) influence ones creativity at workplace. Vithayathawornwong *et al.* (2003) in their study suggested that the effective and fundamental role of the physical environment to

promote creativity within an organization is mainly mediated by the social-psychological work environment. In fact the social-psychological work environment which is recommended by the literature can be summarized along an individual's interpersonal and organizational continuum. Shalley and Gilson (2004) also in their review study mentioned that there are some factors at organizational level (e.g. organizational climate, HRM practices), at team level (e.g. social context, group composition) and at job level (e.g. complex and demanding jobs, autonomy, goal setting, sufficient resources, rewards, supervisory support, external evaluation of work) which influence creativity. Thus, within a work environment the role of both social-psychological work environment and the physical work environment are supposed to affect and support creativity.

Moreover and overall in the field of human factors and ergonomics, designing workspaces to promote creativity is a new field. Generally, the purpose of human factors and ergonomics is to design work environments for human well-being and overall system performance. So, it is possible to expect that workplaces which were designed to promote creative performance will also promote well-being by enhancing satisfaction with work environment and job satisfaction and reduce employees' level of psychological stress and turnover (Shalley *et al.*, 2000). Besides the effect of physical environment of workplace on people's well-being, it can also affect their information channels, interpersonal interactions, and the availability of knowledge and equipment. Overall, promoting individuals' creativity is possible due to paying more attention to environmental design and facilitating the work environment based on employees' needs and expectations.

4. THE IMPORTANCE OF INDIVIDUAL CONTROL OVER THE PHYSICAL WORK ENVIRONMENT

Today because of rapid growth in technology and organizational development problems related to work environment can be viewed as continuous challenge. In fact, workspace issues are become more obvious as work increasingly moves from physical production to mental production (Luck, 2003). Moreover, the mental production of innovation is pertinent to the success of organizations and is enhanced by an individual's ability to arrange their physical environment to fit their personal and work related needs. So, personal control over the workspace is expected to be a key factor in a person's ability to be creative (Luck, 2003).

Personal control is a variable that has been shown to play an important role in human behaviour (Spector, 1986; Lee, 2006; Lee and Brand, 2005). In previous studies the terms individual control which also called perceived control refers to the perception of an individual's to have control over a situation (Lee and Brand,

2005). In fact, the degree to which an individual believes that it is possible to directly affect the environment has significant effect on perceptions of that environment and reactions to it (Luck, 2003). The concept of personal control over the physical setting of the workplace refers to two categories: a) tangible items and b) intangible items.

As suggested by Luck (2003) tangibles items in workspace which have the most effects on individual creativity are: a) the size of office space and b) desk and surface area. As mentioned by Luck (2003) "participants found these two items very important for facilitation of their creativity (p. 26). Intangible items within the workspace that organizations consider difficult to quantify refer to those items that person's experience through their senses and are more difficult to control than tangible ones. Intangibles items are categories into two parts: a) facilitators, and b) distractors. Facilitators included the view, visual diversity, and colours (Luck, 2003). As indicated by Luck (2003), participants were clearly motivated by environments over which they had control and felt creatively stifled by environments in which they had no control.

As mentioned earlier the main reason behind the establishment of open-plan offices were to reduce the costs of workplaces designing and maintenance and enhance communications between co-workers by reducing or totally removing physical boundaries between workstations. However, easily accessible workspaces do not necessarily lead to better interactions and communication (Brennan *et al.*, 2002; Kaarlela-Tuomaala *et al.*, 2009). Due to lack of privacy, the amount of social interaction and communication between co-workers may go beyond the optimum level and employees might feel crowded and difficult to concentrate. Lack of privacy and uncontrollable working condition affect employees through decreasing their concentration, increasing stress (Rashid *et al.*, 2009) and inclination to work in private rooms (Lee and Brand, 2005). So, as suggested by previous studies environmental distraction as a negative feature of uncontrollable environment in open-plan offices is expected to be negatively associated with individuals' satisfaction with the physical work environment (O'Neill, 2008; Brennan *et al.*, 2002) and decrease their performance (Veitch *et al.*, 2007; Roelofsen, 2008).

Previous studies emphasize the importance of office workers' ability to control their work environment and to focus on their work without any distractions from their workspace (Roelofsen, 2008; Jahncke, 2012; Banbury and Berry, 2005). Personal control over the workspace can reduce the negative effect of distraction from the work environment (Lee and Brand, 2010) and enhance employees satisfaction with work environment (Lee and Brand, 2005). It also reduces the negative effect of psychological and employees' turnover plan (Huang *et al.*, 2004; Leather *et al.*, 2003; O'Neill and Carayon, 1993; Chiu *et al.*, 2005) and enhances their performance and

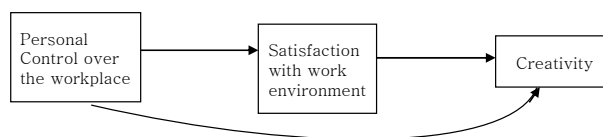


Figure 2. The impact of personal control over the workplace on employees' creativity.

creative outcome as well (Lee and Brand, 2005). Personal control over the physical aspects of the work environment such as lighting can improve individuals' mood, well-being, and satisfaction, but cannot improve their task performance (Veitch *et al.*, 2004; Veitch and Gifford, 1996a; Veitch and Gifford, 1996b). In fact as suggested by previous studies personal control over the work environment is necessary for individual well-being (Brager *et al.*, 2004; Huang *et al.*, 2004). Empirical studies also have indicated that the availability of choices in the physical environment will lead to better outcomes for employees, such as better performance and improved mood (Paciuk, 1990, Parker *et al.*, 2013, Veitch and Gifford, 1996b; Galasiu and Veitch, 2006).

Based on the broaden-and-build theory of positive emotions, positive and good feelings change people's bodily systems and predict healthier mental and physical outcomes such as reducing stress and physical pain; it also modify people's perception and insight (Fredrickson, 2001; Fredrickson and Branigan, 2005). As mentioned earlier, positive emotions in the workplace help employees achieve beneficial outcomes including improve they attention and thinking, success, job enhancement, and creative outcome. So, one way to extend the scope of attention, increases insight, and promote creativity is through encouraging people's positive emotions and mood (Amabile *et al.*, 2005; Fredrickson and Branigan, 2005).

In fact as mentioned above personal control over the work environment can reduce the negative effect of distraction from the work environment (Lee and Brand, 2010) which also can enhance individual satisfaction with work environment and also satisfaction with job (Paciuk, 1990; Sundstrom *et al.*, 1994; Lomonaco and Miller, 1997). Satisfaction with work environment happened in situation when employees can meet their fundamental needs and can enhance their well-being and may positive mood and emotion (Choi, 2011; Lee, 2007; Rashid *et al.*, 2009; Sundstrom *et al.*, 1994; Veitch *et al.*, 2007). Therefore since affection, feeling and emotions have a significant effect on individual creativity (Amabile *et al.*, 2005; Fredrickson and Branigan, 2005), so satisfaction with work environment may have positive role to enhance individual creativity at work.

5. CONCLUSION

In the area of ergonomic and human factors design-

ing work environment to promote creativity is a new field. Many studies have been conducted on work environment and employees' performance, but there are a few numbers of studies which focused on the relationship between the perception of personal control over the physical work environment and satisfaction with work environment to affect individual creativities at work. In fact, it seems very important and essential for organizations to keep their employees satisfied with their work environment, because this satisfaction has been shown to be directly associated with employees' job fulfilment and it can affect turnover plan and commitment indirectly (Carlopio, 1996). Moreover having personal control over the physical work environment is a very important and critical to affect satisfaction and enhance individual performance which may have creative outcome a well (Lee and Brand, 2005). As slugged by previous studies the role of environmental control is like a "lever" within an organization by which individuals, groups and firms can optimize their workspaces in order to serve their business goals (Paciuk, 1990, Sargent and Terry, 1994, Sargent and Terry, 1998, Veitch and Newsham, 2000).

Open-plan offices is the most growing type of office design in today's industries are mainly famous because many employees are placed in a giant space and work individually or as a group; this situation can enhance their communication and creativity (Brennan *et al.*, 2002; Rashid *et al.*, 2009). Back to the nature of these types of office design they get a group of people with different needs working in same condition, therefore some ambient conditions which normally are flexible such as room temperature and lighting are fixed to a certain level without much opportunity to modify and personalise them. Moreover, many technical systems, as well as the heating, ventilation, and air conditioning (HVAC) are designed to use in private rooms not in open-plan workspaces, and even most of the existing buildings are frequently built to provide for private offices rather than open-plan layouts (Rasila and Rothe, 2012). This may lead to dissatisfaction and decrease productivity.

Moreover, open-plan office design does create some other problems and distractions due to lack of personal control over the work environment which can decrease individual satisfaction with work environment and negatively affect their creativity. Organizations also might increase their outcome by giving employees the opportunity to control the physical work environment (MacMillan, 2012). Thus, apparently employees need to have the ability to control their ambient conditions at workspace, which can motivate them to perform their tasks better and enhance their environmental satisfaction, effectiveness and creativity. Hence, personal control over the work environment becomes crucial. Personal control over the workspace can reduce the negative effect of environmental distraction and improve individuals' mood and enhance their level of environmental satisfaction, pro-

ductivity and creativity at work (Baron, 1990; Veitch *et al.*, 2004; Lee and Brand, 2010).

As suggested by Stokols *et al.* (2002) high level of environmental distractions have low level of support for creativity at work environment. In fact, distraction is a negative feature of the workplace often expected to be negatively linked to individual satisfaction with the work environment (Lee and Brand, 2005) and reduce their moral and performance (Jahncke *et al.*, 2011; Rashid *et al.*, 2009). The main reason behind distraction in open-plan offices is backed to lack of personal control over ambient conditions. Thus, having control over the work environment which seems difficult and impossible most of the times in open-plan office environments is critical for employees' well-being and satisfaction. In fact, satisfaction with work environment happened in situation when employees can meet and answer their fundamental needs and requirements at workspace such as appropriate working condition, suitable lighting, appropriate room temperature, etc. (Choi, 2011; Lee, 2007; Rashid *et al.*, 2009; Sundstrom *et al.*, 1994; Veitch *et al.*, 2007). So in condition while employees have more control over the ambient condition of the workplace they may have more satisfaction too.

In fact, within a work environment, the role of some factors is like a motivator which promotes. Based on the broaden-and-build theory of positive emotions (Fredrickson, 1998) a positive or happy person will have a better ability to be creative than an unhappy or negative person (Fredrickson, 2001). As indicated affection and emotions (both positive and negative) have been shown to be linked with multiple cognitive, interpersonal outcome, and physiological activities (Fredrickson, 2001). Empirical studies in the field of creativity suggest that emotions (both positive and negative mood) have a significant role to enhance creativity at work too (George and Zhou, 2002; Amabile *et al.*, 2005; Zhou and George, 2001). The broaden-and-build theory (Fredrickson, 1998) describes the meaning of a subset of positive emotions, including joy, love, happiness, and well-being. The theory supports the idea that a positive or happy person will have a better ability to be creative rather an unhappy or negative person (Fredrickson, 2001). Therefore as indicated emotions and well-binge have significant effects on individual creativity. Moreover as also suggested satisfaction with workplace also has critical effect to enhance individual outcome including creativity and productivity at work.

REFERENCES

- Al-Anzi, N. M. (2009), *Workplace environment and its impact on employee performance*, Degree of Master of Business Administration, University of Malaysia

- Amabile, T. (1996), *Creativity and Innovation in Organizations*, Boston, Harvard Business School.
- Amabile, T. (1998), *How to kill creativity*, Harvard Business School Publishing.
- Amabile, T., Barsade, S. G., Mueller, J. S., and Staw, B. M. (2005), Affect and creativity at work, *Administrative Science Quarterly*, **50**, 367-403.
- Amabile, T., Conti, R., Coon, H., Lazenby, J., and Herron, M. (1996), Assessing the work environment for creativity, *Academy of Management Journal*, **39**.
- Amabile, T. and Pillemer, J. (2012), Perspectives on the Social Psychology of Creativity, *The Journal of Creative Behavior*, **46**, 3-15.
- Baldry, C. and Barnes, A. (2012), The open-plan academy: space, control and the undermining of professional identity, *Work, Employment and Society*, **26**, 228-245.
- Banbury, S. and Berry, D. (2005), Office noise and employee concentration: Identifying causes of disruption and potential improvements, *Ergonomics*, **48**, 25-37.
- Baron, R. A. (1990), Environmentally Induced Positive Affect: Its Impact on Self-Efficacy, Task Performance, Negotiation, and Conflict, *Journal of Applied Social Psychology*, **20**, 368-384.
- Brager, G. S., Paliaga, G. and De Dear, R. (2004), Operable Windows, Personal Control, and Occupant Comfort, *Ashrae Transactions*, **110**.
- Brennan, A., Chugh, J. S. and Kline, T. (2002), Traditional versus Open Office Design A Longitudinal Field Study, *Environment and Behavior*, **34**, 279-299.
- Briner, R. (2000), Relationships between work environments, psychological environments and psychological well-being, *Occupational medicine*, **50**, 299-303.
- Carlopio, J. R. (1996), Construct validity of a physical work environment satisfaction questionnaire, *Journal of Occupational Health Psychology*, **1**(330).
- Carnevale, D. G. (1992), Physical settings of work: A theory of the effects of environmental form, *Public Productivity and Management Review*, 423-436.
- Chiu, C.-K., Chien, C.-S., Lin, C.-P. and Hsiao, C. Y. (2005), Understanding hospital employee job stress and turnover intentions in a practical setting: the moderating role of locus of control, *Journal of management development*, **24**, 837-855.
- Choi, S. (2011), *The Relationships among Indoor Environmental Quality, Occupant Satisfaction, Work Performance, and Sustainability Ehtic in Sustainable Buildings* University of Minnesota.
- Davis, M. C., Leach, D. J. and Clegg, C. W. (2011), The Physical Environment of the Office: Contemporary and Emerging Issues. In: Gerard P. Hodgkinson and Ford, J. K. (eds.), *Organizational and Industrial Psychology*, International Review of Industrial and Organizational Psychology.
- Davis, T. R. (1984), The influence of the physical environment in offices, *Academy of management review*, 271-283.
- De Croon, E., Sluiter, J., Kuijer, P. P. and Frings-Dresen, M. (2005), The effect of office concepts on worker health and performance: a systematic review of the literature, *Ergonomics*, **48**, 119-134.
- De Stobbeleir, K. E. M., Ashford, S. J. and Buyens, D. (2011), Self-regulation of creativity at work: the role of feedback-seeking behavior in creative performance, *Academy of Management Journal*, **54**, 811-831.
- Dul, J. and Ceylan, C. (2014), The Impact of a Creativity-supporting Work Environment on a Firm's Product Innovation Performance, *Journal of Product Innovation Management*, **31**, 1254-1267.
- Duval, C. L., Veitch, J. A. and Charles, K. E. (2002), Open-plan office density and environmental satisfaction. National Research Council Canada, Ottawa: Institute for Research in Construction.
- Edelson, P. J. and Malone, P. L. (1999), *Enhancing creativity in adult and continuing education: Innovative approaches, methods, and ideas*, Jossey-Bass.
- El-Zeiny, R. M. A. (2012), The Interior Design of Workplace and its Impact on Employees' Performance: A Case Study of the Private Sector Corporations in Egypt, *Procedia-Social and Behavioral Sciences*, **35**, 746-756.
- Elsbach, K. D. and Pratt, M. G. (2007), 4 The Physical Environment in Organizations, *The Academy of Management Annals*, **1**, 181-224.
- Fredrickson, B. L. (1998), What good are positive emotions? *Review of General Psychology*, **2**, 300.
- Fredrickson, B. L. 2001. The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions, *American Psychologist*, **56**, 218.
- Fredrickson, B. L. and Branigan, C. (2005), Positive emotions broaden the scope of attention and thought action repertoires, *Cognition and Emotion*, **19**, 313-332.
- Galasiu, A. D. and Veitch, J. A. (2006), Occupant preferences and satisfaction with the luminous environment and control systems in daylit offices: a literature review, *Energy and Buildings*, **38**, 728-742.
- George, J. M. and Brief, A. P. (1992), Feeling good-doing good: a conceptual analysis of the mood at work-organizational spontaneity relationship, *Psychological bulletin*, **112**, 310.
- George, J. M. and Zhou, J. (2002), Understanding when bad moods foster creativity and good ones don't: the role of context and clarity of feelings, *Journal of applied Psychology*, **87**, 687.
- Gurteen, D. (1998), Knowledge, creativity and innovation, *Journal of knowledge management*, **2**, 5-13.
- Harter, J. K., Schmidt, F. L. and Keyes, C. L. (2003),

- Well-being in the workplace and its relationship to business outcomes: A review of the Gallup studies, *Flourishing: Positive psychology and the life well-lived*, **2**, 205-224.
- Hedge, A. (1982), The Open-Plan Office A Systematic Investigation of Employee Reactions to Their Work Environment, *Environment and Behavior*, **14**, 519-542.
- Heerwagen, J. (2000), Green buildings, organizational success and occupant productivity, *Building Research and Information*, **28**, 353-367.
- Hua, Y. (2007), *Designing open-plan workplaces for collaboration: An exploration of the impact of workplace spatial settings on space perception and collaboration effectiveness*, Doctoral dissertation, Carnegie Mellon University.
- Hua, Y. (2010), A model of workplace environment satisfaction, collaboration experience, and perceived collaboration effectiveness: A survey instrument, *International Journal of Facility Management*, **1**.
- Hua, Y., Loftness, V., Heerwagen, J. H. and Powell, K. M. (2011), Relationship between workplace spatial settings and occupant-perceived support for collaboration, *Environment and Behavior*, **43**, 807-826.
- Huang, Y. H., Robertson, M. M. and Chang, K. I. (2004), The role of environmental control on environmental satisfaction, communication, and psychological stress effects of office ergonomics training, *Environment and Behavior*, **36**, 617-637.
- Hwang, T. and Kim, J. T. (2013), Assessment of Indoor Environmental Quality in Open-Plan Offices, *Indoor and Built Environment*, **22**, 139-156.
- Jahncke, H. (2012), *Cognitive Performance and Restoration in Open-Plan Office Noise*, Doctor of Philosophy, University of Gävle.
- Jahncke, H., Hygge, S., Halin, N., Green, A. M. and Dimberg, K. (2011), Open-plan office noise: Cognitive performance and restoration, *Journal of Environmental Psychology*, **31**, 373-382.
- Kaarlela-Tuomaala, A., Helenius, R., Keskinen, E. and Hongisto, V. (2009), Effects of acoustic environment on work in private office rooms and open-plan offices—longitudinal study during relocation, *Ergonomics*, **52**, 1423-1444.
- Landry, D. R. (2012), *Encouraging Creativity in the Workplace Through the Physical Environment: Focusing of the Office Workstation*, Master of Science, University of Nebraska-Lincoln.
- Larsen, L., Adams, J., Deal, B., Kweon, B. S. and Tyler, E. (1998), Plants in the Workplace The Effects of Plant Density on Productivity, Attitudes, and Perceptions, *Environment and Behavior*, **30**, 261-281.
- Leather, P., Beale, D. and Sullivan, L. (2003), Noise, psychosocial stress and their interaction in the workplace, *Journal of Environmental Psychology*, **23**, 213-222.
- Lee, S. Y. (2006), Expectations of employees toward the workplace and environmental satisfaction, *Facilities*, **24**, 343-353.
- Lee, Y. S. (2007), *The Relationship Between Indoor Environmental Quality and Worker Satisfaction and Performance in Leadership in Energy and Environmental Design (LEEDRTM) Certified Buildings*, Pro Quest.
- Lee, Y. S. and Brand, J. L. (2005), Effects of control over office workspace on perceptions of the work environment and work outcomes, *Journal of Environmental Psychology*, **25**, 323-333.
- Lee, Y. S. and Brand, J. L. (2010), Can personal control over the physical environment ease distractions in office workplaces?, *Ergonomics*, **53**, 324-335.
- Lomonaco, C. and Miller, D. (1997), Environmental Satisfaction, Personal Control and the Positive Correlation to Increased Productivity, Johnson Controls, Inc.
- Luck, G. (2003), *The Relationship of an Innovative Thinking Style, Locus of Control and Perceived Control on Job Satisfaction and Workspace Preferences Among Knowledge Workers*, Doctor of Philosophy, California School of Professional Psychology. Los Angeles, California
- Macmillan, C. (2012), *The Effects of Physical Work Environment Satisfaction and Shared Workspace Characteristics on Employee Behaviors Toward Their Organization: Using Environmental Control as a Mediator*, Masters of Applied Psychology University of Waikato.
- Martin, A. J. (2005), The role of positive psychology in enhancing satisfaction, motivation, and productivity in the workplace, *Journal of Organizational Behavior Management*, **24**, 113-133.
- Mccooy, J. M. and Evans, G. W. (2002), The potential role of the physical environment in fostering creativity, *Creativity Research Journal*, **14**, 409-426.
- Mcguire, D. and McLaren, L. (2009), The impact of physical environment on employee commitment in call centres: The mediating role of employee well-being, *Team Performance Management*, **15**, 35-48.
- Miller, A. M. (2005), *Fun in the workplace: Toward an environment-behavior framework relating office design, employee creativity, and job satisfaction*, Master Of Interior Design, University of Florida.
- Moultrie, J., Nilsson, M., Dissel, M., Haner, U. E., Janssen, S. and Van Der Lugt, R. (2007), Innovation spaces: towards a framework for understanding the role of the physical environment in innovation, *Creativity and Innovation Management*, **16**, 53-65.
- Newsham, G., Veitch, J., Arsenault, C. and Duval, C. (2004), Effect of dimming control on office worker satisfaction and performance. Institute for Research in Construction, National Research Council, Canada.

- Niemelä, R., Rautio, S., Hannula, M. and Reijula, K. (2002), Work environment effects on labor productivity: an intervention study in a storage building, *American journal of industrial medicine*, **42**, 328-335.
- O'Neill, M. J. (2010), A model of environmental control and effective work, *Facilities*, **28**, 118-136.
- O'Neill, M. J. and Carayon, P. (1993), The relationship between privacy, control, and stress responses in office workers. Proceedings of the Human Factors and Ergonomics Society Annual Meeting, SAGE Publications, 479-483.
- O'Neill, M. (2008), Open Plan and Enclosed Private Offices. Knoll, Inc.
- Oksanen, K. and Ståhle, P. (2013), Physical environment as a source for innovation: investigating the attributes of innovative space, *Journal of knowledge management*, **17**, 815-827.
- Paciuk, M. (1990), The role of personal control of the environment in thermal comfort and satisfaction at the workplace, *Environmental Design Research Association*.
- Parker, S. L., Jimmieson, N. L. and Amiot, C. E. (2013), Self-determination, control, and reactions to changes in workload: A work simulation, *Journal of Occupational Health Psychology*, **18**, 173.
- Rashid, M., Wineman, J. and Zimring, C. (2009), Space, behavior, and environmental perception in open-plan offices: a prospective study, *Environment and Planning B: Planning and Design*, **36**, 432-449.
- Rasila, H. and Rothe, P. (2012), A problem is a problem is a benefit? Generation Y perceptions of open-plan offices, *Property Management*, **30**, 362-375.
- Roelofsen, P. (2002), The impact of office environments on employee performance: The design of the workplace as a strategy for productivity enhancement, *Journal of Facilities Management*, **1**, 247-264.
- Roelofsen, P. (2008), Performance loss in open-plan offices due to noise by speech, *Journal of Facilities Management*, **6**, 202-211.
- Sargent, L. and Terry, D. J. (1994), *The effects of work control and job demands on employee adjustment and work performance*, University of Queensland.
- Sargent, L. D. and Terry, D. J. (1998), The effects of work control and job demands on employee adjustment and work performance, *Journal of Occupational and Organizational Psychology*, **71**, 219-236.
- Shalley, C. E. and Gilson, L. L. (2004), What leaders need to know: A review of social and contextual factors that can foster or hinder creativity, *The Leadership Quarterly*, **15**, 33-53.
- Shalley, C. E., Gilson, L. L. and Blum, T. C. (2000), Matching Creativity Requirements and the Work Environment: Effects on Satisfaction and Intentions to Leave, *Academy of Management Journal*, 215-223.
- Shibata, S. and Suzuki, N. (2002), Effects of the foliage plant on task performance and mood, *Journal of Environmental Psychology*, **22**, 265-272.
- Shibata, S. and Suzuki, N. (2004), Effects of an indoor plant on creative task performance and mood, *Scandinavian Journal of Psychology*, **45**, 373-381.
- Shipton, H. J., West, M. A., Parkes, C. L., Dawson, J. F. and Patterson, M. G. (2006), When promoting positive feelings pays: Aggregate job satisfaction, work design features, and innovation in manufacturing organizations, *European Journal of Work and Organizational Psychology*, **15**, 404-430.
- Slijkhuis, J., Rietzschel, E. F. and VAN Yperen, N. W. (2013), How evaluation and need for structure affect motivation and creativity. *European Journal of Work and Organizational Psychology*, **22**, 15-25.
- Spector, P. E. (1986), Perceived control by employees: A meta-analysis of studies concerning autonomy and participation at work, *Human Relations*, **39**, 1005-1016.
- Stokols, D., Clitheroe, C. and Zmuidzinis, M. (2002), Qualities of work environments that promote perceived support for creativity, *Creativity Research Journal*, **14**, 137-147.
- Sundstrom, E., Herbert, R. K. and Brown, D. W. (1982), Privacy and Communication in an Open-Plan Office A Case Study, *Environment and Behavior*, **14**, 379-392.
- Sundstrom, E., Town, J. P., Rice, R. W., Osborn, D. P. and Brill, M. (1994), Office noise, satisfaction, and performance, *Environment and Behavior*, **26**, 195-222.
- Thatcher, A. and Milner, K. (2012), The impact of a 'green' building on employees' physical and psychological wellbeing. *Work: A Journal of Prevention, Assessment and Rehabilitation*, **41**, 3816-3823.
- Veitch, J. A., Charles, K. E., Farley, K. M. and Newsham, G. R. (2007), A model of satisfaction with open-plan office conditions: COPE field findings, *Journal of Environmental Psychology*, **27**, 177-189.
- Veitch, J. A., Charles, K. E. and Newsham, G. R. (2004), *Workstation design for the open-plan office*, Institute for Research in Construction, National Research Council of Canada.
- Veitch, J. A. and Gifford, R. (1996a), Assessing beliefs about lighting effects on health, performance, mood, and social behavior, *Environment and Behavior*, **28**, 446-470.
- Veitch, J. A. and Gifford, R. (1996b), Choice, perceived control, and performance decrements in the physical environment, *Journal of Environmental Psychology*, **16**, 269-276.
- Veitch, J. A. and Newsham, G. R. (2000), Exercised control, lighting choices, and energy use: An office simulation experiment, *Journal of Environmental Psy-*

- chology*, **20**, 219-237.
- Vischer, J. C. (2007), The effects of the physical environment on job performance: towards a theoretical model of workspace stress, *Stress and Health*, **23**, 175-184.
- Vischer, J. C. (2008), Towards an environmental psychology of workspace: how people are affected by environments for work, *Architectural Science Review*, **51**, 97-108.
- Vithayathawornwong, S., Danko, S. and Tolbert, P. (2003), The role of the physical environment in supporting organizational creativity, *Journal of Interior Design*, **29**, 1-16.
- Ward, T. B. (2004), Cognition, creativity, and entrepreneurship, *Journal of Business Venturing*, **19**, 173-188.
- Waugh, C. E. and Fredrickson, B. L. (2006), Nice to know you: Positive emotions, self-other overlap, and complex understanding in the formation of a new relationship, *The Journal of Positive Psychology*, **1**, 93-106.
- Woodman, R. W., Sawyer, J. E. and Griffin, R. W. (1993), Toward a theory of organizational creativity, *Academy of management review*, 293-321.
- Zhou, J. and George, J. M. (2001), When job dissatisfaction leads to creativity: Encouraging the expression of voice, *Academy of Management Journal*, **44**, 682-696.