

An Overview of Neglected, but Important Factors Affecting Employee's Productivity, Health and Safety in the Workplace

Oyesola Animashaun

Kola O. Odeku

Faculty of Management and Law, University of Limpopo, Turfloop, South Africa

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Abstract

Majority of the people tend to spend quite an ample amount of time in their workplaces. Depending on the working hours in each jurisdiction, workers spend between eight to ten hours at work. Furniture, equipment, lights and devices are usually put in place to facilitate and improve work environment. The importance of furniture and infrastructure, the way and manner they are designed and placed, and the environmental conditions of the workplace become crucial when linked to the comfort or discomfort of the user. Poorly arranged office furniture and infrastructure can definitely be a source of reduction in productivity and output in the workplace. This article looks at the dynamic nature of furniture and office infrastructure as well as environmental conditions in the workplace, by assessing whether they have significant impact or are impediment to the day to day running of business ventures.

Keywords: Office furniture, Convenience, Workforce, Impediment, Productivity.

1. Introduction

Workplace furniture comprises of desks, chairs, the filing cabinet shelves, drawers, lights, noise and many others.. All these components have a specific role to play in the proper functioning of any office, the productivity and the efficiency of the employees (Charles et al. 2004) When considering various options of equipping an office, it is imperative that the office furniture should be those that are ergonomic (Wilks et al. 2006). Ergonomics is simply defined as the science of work (Wilson RW 2000). According to Adams (2014) "ergonomics derives from two Greek words: ergon, meaning work, and nomoi, meaning natural laws. Combined they create a word that means the science of work and a person's relationship to that work." As a principle, it is also known as the science of fitting the work to the user instead of forcing the user to fit the work (Pheasant and Haslegrave, 2005). In the work place the essence and need for ergonomics are to ensure maximisation of productivity by reducing operator fatigue and discomfort (Bridger, 2008). It is also referred to biotechnology, human engineering, human factors engineering (Boff, 2006). The overall benefits to the workers in the workplace are to make products and tasks comfortable and efficient for the user (Peter et al. 2006).

The choice of workplace furniture is important, because an employee needs them to function effectively in the office (Schriefer, 2005). If the furniture are uncomfortable and not user friendly, the employee's working style, efficiency and health is affected (Rantanen, 2013). Sometimes, the health problems of employees might have an adverse effect on their productivity, making them more susceptible to errors that may lead to disaster (Clarke and Cooper, 2004). Ergonomic workplace furniture ensures that each employee blends well with things around him, like desks, chairs, computer alignment, including environmental factors (McKeown, 2007). The Employees' works are bound to be affected, if they are uncomfortable due to any reason in the workplace (Freeman, 2010). If all factors surrounding an employee are ergonomically correct, then the employee will be comfortable and remain motivated to give the best (Larsson and Gard, 2003). These days' organizations consult, and even employ ergonomic experts that advice people on how to improve their office ergonomics and what type of furniture would be suitable to make the ergonomics of a work place better (McKeown, 2007). Having ergonomic office furniture reduces the risk of injury (Fabrizio, 2009). They are designed in manner that make them safe and reduce the possibility of accidents in the work place (Pheasant and Haslegrave, 2005). Workplace furniture like desks can be designed to give more leg room and adequate support to the elbows while working on the computer ((Fabrizio, 2009). The positioning of the computer monitor and the mouse should also be comfortable and convenient, so that the user does not have to strain their eyes to view the computer screen or and stretch uncomfortably far to reach the mouse and the monitor (Timoteo-Afinidad, 2011). Office furniture must not be clustered

together so as to avoid friction and disaster in the workplace (Worthington, 2013). They should be arranged in such a way as to allow easy ingress and egress (Kroemer, 2001). Workplace furniture helps the organization tremendously in increasing its productivity, and at the same time taking care of the employees' health (Bailyn, et al. 2003).

2. Workplace Noise

Workplace noise is probably the most frequently forgotten environmental pollutants with possible far-reaching effects (Ashford, 1976). Noise, harms us in more ways than we can think of, and at times, without us even knowing about it (Schwartz, 2004). We cannot have a noise free world, but we can have a noise safe world (De Long et al. 1990). There are various sources of noise pollution. In some places, noise from construction projects predominate, while in others it is vehicular traffic noise or noise from airports (Baranzini and Ramirez, 2005). Other noise pollutants include noise from occupational settings and conversations (Murphy and King, 2014). In Nigeria for an example, unleashed loudspeakers churches, mosques or entertainment events disturb the neighborhood endlessly day and nights.

Workplace noise poses some serious concerns. Workplace acoustics affects employee's health and safety (Leather et al. 2003). Many studies acknowledge that noise (even at low levels), is a cause of stress that leads health problems such as digestive disorders, headache, hypertension, and ulcers (Bambra, 2011). The health status of employee is directly proportional to the productivity (Burton et al. 2005). Therefore, unhealthy employees are a cause of concern as their health issues could lead to higher disposition to committing errors that may lead to industrial accidents and hazards (Robertson and Cooper, 2011). One of the most important aspects of a well-planned office is the ability to conduct work without distraction (Brennan et al. 2002). Against this backdrop, architects and interior designers have a big and profound responsibility to design functional and sound safe environments (Piotrowski and Rogers, 2010). It is very difficult, if not impossible to meet these goals without considering acoustics (Schodek et al. 2009). Acoustics is essential to the functioning of almost every type of environment (Parsons and Jones, 2000). Some environments can even become dangerously loud and unsafe for the occupants (Sundstrom and Sundstrom, 1986). In order to effectively address these issues, acoustics should be considered in the design phase itself (Sundstrom and Sundstrom, 1986). If workspace does not meet the needs of the end user, or is found to be unsafe, the organisation could be putting the workforce in danger (Barnes, 2001).

Very often, in the workplace environment, noise does not produce visible results (Goleman, 2000). That is probably why people believe that noise does not cause health hazards, however, it does (Cohen S, Weinstein, 1981). For examples it can create health hazards that could cause partial or total hearing loss (Anticaglia and Cohen, 1970). Noise can cause irritation, annoyance, anxiety, anti-social behavior, hostility and violence (Burney, 2009).

When designing an open office, it is important to always consider the acoustic impact of the materials being used (Haapakangas et al. 2011). In planning the layout of the workplace how the job types are being grouped, sound masking, the type of telephones used, panel heights and ceiling systems are to be considered (Marquardt et al. 2002). However, effort to control office noise through sound masking system, more absorbent surfaces and behavioural control have been weakened by increasing office densities and collaborative work in modern workspace (Vischer 2006).

Today, with the endless options in acoustic themes, and the widened horizon of designers, who now combine architecture with acoustic designing, an acoustically perfect, well-furnished office could be designed (Hoffman-Ruddy et al. 2001). This will take care of noise and also give the visual delight of perfect interior designing.

3. Light Intensity in the Workplace

Until recently, the only purpose of indoor lighting was to aid vision, so that visually directed tasks could be accomplished when there was not enough external light (Anshel, 2002). A recent discovery has however shown that, light has an impact beyond merely helping us to see (Shaywitz, 2008). Non-visual receptors in the retina of the eye form nerve pathways that directly influence our biological clock, the part of our brains that controls and moderates sleep and wakefulness, directly affecting our levels of alertness (Anzi, 2009).

Light is an important therapy treatment for individuals who suffer from Seasonal affective disorder (SAD) (Lam, 1998). SAD includes depressive symptoms experienced by approximately six out of one hundred people in the developed world (Moscovitch et al. 2004). Depressive symptom occurs primarily in the autumn and winter months, when the days are shorter. Some studies show as much as 10 percent of people affected by depressive symptoms (Anzi 2009).

SAD is a type of clinical depression related to morning light deprivation, usually in the late fall and winter days (Magnusson and Boivin, 2003). It is an acute depression, which can be a serious, life threatening condition. Thus it

requires medical advice (Morris, 2002). Treatment of SAD consists of exposure to high light levels for 30 minutes each day, preferably before 10:00 a.m (Anzi, 2009).

It is now being suggested that modern working conditions can make these symptoms worse, as many workers spend the majority, if not all daylight hours indoors, exposed to little, if any, natural light (Edwards and Torcellini, 2002). Common knowledge, backed up by scientific research proves that the quality of indoor lighting in the office can have significant effects on the performance and the well-being of employees (Anzi 2009).

In the recent years, the understanding of how light impacts upon our health have grown by leaps and bounds (Rheingold, 1993). The brightness of office light effects alertness, concentration, and task performance (Chellappa et al. 2011). Adjusting the type and quality of light can significantly improve working experience, health and productivity (Anzi, 2009).

Over-lighting or under-lighting can actually make a workplace uncomfortable and distracting (Anshel, 2002). In addition, giving workers control over their lighting has been demonstrated to increase productivity and workplace satisfaction (Newsham et al. 2006).

Newer technologies such as T8 lamps with electronic ballasts increase lighting output, eliminate flickers, offer an excellent color rendition (have a high Color Rendering Index) and save energy (Clinton, 2008). Direct and indirect linear suspended fixtures eliminate glare and increase the visual comfort of the occupants (Rizzo et al. 2010). Dimmable intelligent lighting systems allow the user to control light levels and save energy (Pan et al. 2008).

Using direct lighting to illuminate specific areas instead of relying on ceiling fixtures that brightening entire rooms is an innovative idea (Descottes and Ramos, 2013). Task lamps and desk lamps are essential pieces of office equipment, offering workers the control they need to be comfortable and productive, while reducing energy use (DiLouie, 2006). Dimmers, sensors and multiple switches also enable varied lighting levels to match needs (DiLouie, 2006). Giving workers control over their lighting has been found to result in energy saving and increased workplace satisfaction (John et al. 1988).

Workers who use computer display terminals typically prefer relatively low lighting levels to minimize glare and reflections on their display screens (Osterhaus, 2005). On the other hand, workers who read, write and draw on paper typically prefer higher lighting levels so they can see small letters and fine details (Irlen, 2005). Older workers, and others with weak vision, also need higher lighting levels (Silverstein, 2008). The ability to adjust lighting levels is particularly important for workers seated near windows, who must adapt to varying levels of sunlight during the day, and workers who require adjusted lighting levels for the different daily tasks that they perform (Galasiu et al. 2006).

4. Sky Effect™ Technology

With the understanding of how light affects our bodies, Nature Bright has created a new generation of industrial lighting (Mills and Tomkins, 2007). The Sky Effect™ range of fluorescent lights are specially designed for office and factory use. Unlike conventional lights, these, deliver a far broader spectrum of light (DiLouie, 2011). These new lights incorporate greater levels of shorter wavelength light—light in the blue range of the spectrum (Blackwel et al. 2004). This blue light has been shown to have the greatest effects upon our central biological clock (Froehlich et al. 2002). It also happens to be precisely the spectrum of light that is missing in conventional indoor lighting (Michel, 1995).

This light is only slightly different in appearance to conventional lights. Its brightness is exactly the same and its clarity is pleasing to the eye (Loe and Rowlands, 1996). Sky Effect™ lights are described as having a "higher color temperature" than conventional lights (Mueller et al. 2003). And this higher temperature results in a brighter light for the workers (Wei et al. 2013). The benefits of Sky Effect™ are that it : increases focus, alertness, and concentration boost performance, fends off fatigue, reverses SAD, minimizes lost work time and maximizes productivity (Scarborough AW 2008).

5. Temperature and Humidity

Currently, there are no regulations governing temperature levels in the workplace, and the responsibility of employers to their employees in this respect (Weiler, 2009). The World Health Organization, however, recommends a maximum working temperature of 24°C (Kazmierczak and Connelly, 2012).

During working hours, the temperature in all enclosed workplaces should be reasonable (Roelofsen, 2002). Temperature alone does not ensure 'reasonable' comfort (Schumann and Burillo, 2010). Other factors such as air movement and relative humidity also have a role to play (Ye et al. 2003). In work environment like in Nigeria, where

temperature is high throughout the year, there is a need to install air conditioners and fans in the workplace to make the environment habitable (Arens et al. 2005).

The possible effects of high temperature is, employee lethargy and tiredness, as a result of increased body temperature which leads to possible efficiency decrease, while low temperature levels decreases efficiency due to lower body heat and shivering: (Dhillon S 2012).

High humidity in itself may not be a direct problem, but it does increase susceptibility to high temperature levels, as evaporation of body sweat is impeded (Dhillon, 2012).

Low humidity levels have a debilitating effect on the ability to breathe and swallow without discomfort as the mouth and nose can become dry, due to the increased level of evaporation in the surrounding environment (Maskin, 2007).

Temperature and humidity can have a significant impact on how alert or tired somebody might feel (Zhang et al. 2010). This, in turn, can have a dramatic effect on the health of the worker (Krauss et al. 2003). In hot environments, it is not uncommon for staff to become irritable and less efficient (McCoy and Evans, 2005). It can be very easy for employers to underestimate the importance of general day-to-day comfort (Molloy, 2005). A lot of emphasis has been placed, in recent years, on issues such as maximum working hours, ergonomically designed offices and so on, but the overall comfort of the working conditions of employees can sometimes be overlooked (Antonelli, 2001).

The American Society of Interior Designers (ASID, 1999) carried out an independent study and revealed that, the physical workplace design is one of the top three factors, which affect health, performance and job satisfaction. 31 percent of people were satisfied with their jobs and had pleasing workplace environments. 50 percent of people were seeking jobs and said that they would prefer a job in a company where the physical environment is good.

6. Towards a Safe Place of Work

To ensure the health and safety of the workforce, and the stakeholders at the workplace, the following is pertinent: work areas should be large enough to be safe and healthy (Hart SH 2010). General stability, good ventilation and fresh air, optimum temperature and lighting should be available (Elearn, 2006). Pedestrians and vehicles must be able to circulate safely (Landoni and Pittiglio, 2012). Traffic routes, entrances and exits must be kept clear (Anderson, 2006). Floors, walls, ceilings, roofs, doors and gates, loading bays and ramps must be safe (Thomson, 1997).

Toilet, washing and welfare facilities must be provided (Walia, 2013). In addition, rest rooms, changing rooms and sanitary facilities, facilities for pregnant women, nursing mothers and employees with disabilities must be provided (Polychronakis et al. 2008).

7. The Safe Use of Equipment

Essential warnings and markings should be placed noticeably on work equipment (Slater and Whelpton, 1990). Employees should have access to written instruction and adequate information and training on its use must be given. (Lehto and Salvendy, 1995). Repairs, modifications, maintenance or servicing should be carried out only by competent persons (Tsang, 2002). There should be safe means of access for production work and for maintenance or adjustments (Hale et al. 1988).

All equipment must have proper control devices for starting and stopping (Kemmlert and Lotta Lundholm, 2001). Guards should be placed on equipment where there is a risk from contact, or where there are high or very low temperatures (Thurman et al. 1988). Any equipment from which objects might fall must be fitted with safety devices (Howie, 2008). The containment or extraction of gas, vapour, liquid or dust emissions must be provided for (Carson, 2002). Equipment must be maintained during its working life so that it continues to comply with these requirements (Houshyar, 2004).

8. Personal Protective Equipment (PPE)

Wherever possible, employers must eliminate hazards in places of work at source (DeJoy and Southern, 1993). If these cannot be eliminated totally, they must be reduced to a minimum and adequately controlled (Spellman and Bieber, 2011). PPE must be provided free of charge by the employer and must be used by the employee (Booty, 2009). The personal protective equipment must be suited to the risks involved, take account of the conditions of the place of work, and be suitable to the wearer and for the work to be done (Hughes and Ferrett 2011).

Before choosing PPE, an employer must assess its suitability in relation to the risks involved (Lingard and Holmes,

2001). The employer must also decide on the frequency of use of PPE (Hewitt, 1998). This will take into account the seriousness and frequency of the risk. PPE must be properly maintained and stored (Sargent and Gallo, 2003). Normally, only one employee will use any individual piece of personal equipment. Employees must be specifically informed of the risks for which the PPE is provided. They must be properly instructed and trained in its use, using demonstrations if appropriate (Liedtke, 2005). Information, training and consultation on safety and health must take these requirements into account.

9. Visual Display Units (VDUs)

The regulations cover not just the VDU itself but the operator, the desk, chair and the surrounding area (Marriott and Stuchly, 1986). All workstations must be designed to suit the tasks carried out at them (Toomingas, 2006). The specific requirements for VDUs cover the work environment (including noise, heat and humidity), the display screen (including reflection and glare), the keyboard, desk or work surface, chair and the operators positioning in front of the VDU. The employer must analyse each workstation including the environment (space requirements, lighting, reflections, glare and radiation) and the equipment itself- the display screen, the keyboard and the software in use (Anshel, 2002). Adequate breaks from screen work must be arranged. All employees using VDUs will be entitled to eye tests and spectacles if they are needed for their work and must be advised by their employer of their right to such eye tests (Howard, 2013).

10. Conclusion

The health and safety of employees should be paramount in any workplace. Employers always seek huge output and many dividends, which are essential for the continuation of business ventures. However, this cannot be achieved if the employees are not healthy and comfortable in their workplaces. These sorts of return on investments will only become realistic and achievable if the essential infrastructure such as furniture and other office equipment and suitable environmental conditions-lighting, health, noise control, safety that are needed are provided. This is because they are the major tools that will be deployed for the purposes of making the business a going concern. The work environment should thrive as much as possible to provide and include suitable and convenient office infrastructure and comfortable environmental working conditions that will make the job easier and keep the employees in good health.

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