

ELECTRIC LIGHTING SATISFACTION Talking Points



Keywords: Electric Lighting, Visual Comfort, Satisfaction, Advanced Lighting Controls, Productivity, Mood

Improved visual comfort in the workplace leads to higher building-occupant satisfaction and productivity

- Numerous post-occupancy evaluations have determined that employee satisfaction with their work environment is based on thermal comfort and the ability to control their visual comfort through lighting (Doulos et. al., 2020).
- Visual comfort, thermal comfort and ventilation are ranked as the most desired features with average with average occupants' preferences 24.6%, 23.8% and 21.3%, correspondingly (Doulos et. al., 2020).
- Lighting change has an effect on task significance and autonomy. The fact of having a new lighting installation itself gives the employee the message that he and his job are important (Juslén et. al., 2005).
- Poor lighting can result in eye strain, fatigue and aching, which in turn is likely to lead to deterioration in performance, particularly if work relies on visual acuity such as computer-based (VDT) job roles (Parsons, 2000, Nave 1984). As this type of work is now common place, the importance of lighting for visual health and performance at work is likely to become increasingly important (Silvester & Konstantinou, 2010).

Personal control of an individual's lighting system leads to higher satisfaction and typically a reduction in energy consumption

- Participants with personal control expressed significantly higher satisfaction (Newsham et. al., 2009).
- Participants with personal control expressed significantly lower distraction from changes in temperature and acoustic conditions (Newsham et. al., 2009).
- As related to CCT, females' negative mood decreased in the warm and increased in the cool white light source. Males' negative mood, on the contrary, increased dramatically in the warm compared to the cool condition (Baron et. al., 1992).
- Based on the meta-analysis, the best estimates of average energy savings potential are 24% for occupancy, 28% for daylighting, 31% for personal tuning, 36% for institutional tuning, and 38% for multiple approaches (Williams et. al., 2011).
- The amount of light that is best differs from one person to another as well as the tasks they want to get done. That's why the best solution is to opt for variable or flexible lighting, which allows one to dim overhead lights as well as provide individual light and lamps that can be turned on or off based on a person's preference or task (Luenendonk, 2019).

ELECTRIC LIGHTING SATISFACTION

Talking Points



Employees value their work environment, and especially the visual environment, as part of their compensation package

- Marquardt et al. (2002) suggested that the quality and maintenance of good indoor environments is part of the message management sends to their staff about how they are valued by the organization (Newsham et. al., 2009).
- Employees consider their physical environment as part of their compensation program (Newsham et. al., 2009).
- The results also suggest that employees' opinion of their management is influenced by the quality of the physical environment that the management provides and maintains (Newsham et. al., 2009).
- A study by the American Society of Interior Design shows that 68% of employees complain about the lighting situation in their offices. Because of poor lighting, people get headaches due to the strain it puts on their eyes (Luenendonk, 2019).

ELECTRIC LIGHTING SATISFACTION

Talking Points



KEY REFERENCES

Primary Research

- Doulos, Lambros T, Tsangrassoulis, Aris, Madias, Evangelos-Nikolaos, Niavis, Spyros, Kontadakis, Antonios, Kontaxis, Panagiotis A, Kontargyri, Vassiliki T, et al. 2020. "Examining the Impact of Daylighting and the Corresponding Lighting Controls to the Users of Office Buildings." *Energies (Basel)* 13 (15). MDPI AG: 4024. doi:10.3390/en13154024.
- Juslén, Henri, and Tenner, Ariadne. 2005. "Mechanisms Involved in Enhancing Human Performance by Changing the Lighting in the Industrial Workplace." *International Journal of Industrial Ergonomics* 35 (9). Elsevier B.V: 843–55. doi:10.1016/j.ergon.2005.03.002.
- Jo Silvester and Dr. Efrosyni Konstantinou. "Lighting, Well-being and Performance at Work." Philips Lighting. 2010
- Newsham, Guy, Mancini, Sandra, Veitch, Jennifer, Marchand, Roger, Lei, William, Charles, Kate, and Arsenault, Chantal. 2009. "Control Strategies for Lighting and Ventilation in Offices: Effects on Energy and Occupants." *Intelligent Buildings International (London)* 1 (2). Taylor & Francis Group: 101–21. doi:10.3763/inbi.2009.0004.
- Newsham, Guy, Brand, Jay, Donnelly, Cara, Veitch, Jennifer, Aries, Myriam, and Charles, Kate. 2009. "Linking Indoor Environment Conditions to Job Satisfaction: a Field Study." *Building Research and Information : the International Journal of Research, Development and Demonstration* 37 (2). Routledge: 129–47. doi:10.1080/09613210802710298.
- Baron, R. A, Rea, M. S, and Daniels, S. G. 1992. "Effects of Indoor Lighting (illuminance and Spectral Distribution) on the Performance of Cognitive Tasks and Interpersonal Behaviors : the Potential Mediating Role of Positive Affect." *Motivation and Emotion* 16 (1). Heidelberg: Springer: 1–33. doi:10.1007/BF00996485.
- Williams, Alison, Barbara Atkinson, Karina Garbesi, and Francis Rubinstein. 2011. "A Meta-Analysis Of Energy Savings From Lighting Controls In Commercial Buildings". Ernest Orlando Lawrence Berkeley National Laboratory. https://eta.lbl.gov/sites/default/files/publications/a_meta-analysis_of_energy_savings_from_lighting_controls_in_commercial_buildings_lbnl-5095e.pdf.
- Luenendonk, Martin. 2019. "How Lighting Affects Productivity And Mood". *Cleverism*. <https://www.cleverism.com/how-lighting-affects-productivity-and-mood/>.