



**Politecnico
di Torino**

Honors Thesis

Master's Degree Architecture for Sustainability.

Abstract

**Exploring the evolution and impact of integrative lighting on the design practice:
from a systematisation of research methods to a case study application**

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Light as a physical phenomenon affects the human organism and its photosensitive systems, leading to a range of visual and non-visual responses. The recently developed discipline of Integrative Lighting considers both visual and non-visual effects of light on humans to facilitate visual tasks but also support overall health and wellbeing. This paradigm shift in lighting practice is underpinned by the discovery of intrinsically photosensitive retinal ganglion cells (ipRGCs) and the photopigment melanopsin, playing a Non-Image-Forming (NIF) role, which prompted a number of studies aimed on enhancing human non-visual wellbeing in indoor environments and developing recommendations in the matter. This relatively recent research is based on a range of methodologies with very different characteristics. As light is able to influence numerous and intrinsically different variables, ranging from environmental factors and conditions to physiological and psychological processes, it is evident that a need exists for the organisation and systematisation of these methods in order to provide research with a suitable tool. This thesis proposes such a tool for standardising research approaches in Integrative Lighting. The tool was then applied in a real case study at the Politecnico di Torino offices; field measurements were taken and daylight and electric light simulations were carried out in order to approach the current recommendations in the practice of Integrative Lighting, which are gaining ground in the most recent lighting standards, currently oriented towards the holistic wellbeing of the person in the built environment.



