

An Example of a Comprehensive Post-Occupancy Evaluation of a Multifamily Property That Incorporates Socioeconomic, Energy, and LCA Analyses

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Abstract

Human interaction within buildings has a significant impact on environmental effects and energy usage. Also, the structure and its surroundings have an impact on how people live. So, both technical fields and the social sciences are interested in human-building relations. But social sciences and building engineering rarely complement one another. In this paper, a post-occupancy multidisciplinary evaluation of a brand-new, fully occupied rental multifamily home is conducted.

Keywords: Architecture; Human building relations; Home

Introduction

The building industry offers a lot of promise for solving the current energy and environmental problems. In actuality, people—for whom buildings are intended—consume more energy than the buildings themselves. The human dimension, which is still frequently ignored in modern building techniques, has been a major focus of building energy research for more than a decade. On the other hand, social sciences have explored how the use of space and energy resources, as well as how a building's design and its surroundings affect human way of life [1]. To strengthen each field, it would be advantageous to bridge disciplinary divides and move towards more interdisciplinary [2].

Methodology

The literature lists a few instances of engineering and sociological teams working together on building studies. Building engineers, social scientists, mathematicians, environmental scientists, architects, and psychologists collaborated on the CaRB (Carbon Reduction in Buildings) project and carried out modelling, monitoring, and interviewing. The context of energy retrofit necessitates more transdisciplinarity, as demonstrated by Sibilla and Kurul. In that regard, initiatives like ReBo (Strategies for Integrated Sustainable Renovation) and SIRen (Sustainable Integrated Renovation) included stakeholders from the engineering, architecture, social sciences, and non-academic partners, exchanging ideas through meetings, seminars, and workshops, and putting their approaches to use in real-world settings [3,4]. Researchers from technological, behavioural, and medical disciplines discovered characteristics that have an impact on health and well-being during a workshop for the Healthy Indoor Environments project [5].

Discipline studies weren't always conducted on the same building in these earlier projects. Traditional surveys or interviews were used in sociological investigations. Although building CO₂ emissions were occasionally looked into, the LCA methodology was not used. For the lack of interdisciplinarity in existing building studies, a number of obstacles were found. Due to the fact that disciplines do not share the same terminology and concepts, communication problems were frequently noted within them. Each discipline used a different set of operating procedures and techniques. Hence, Pellegrino and Musy advised devoting time to conceptualising and debating approaches before analysing transdisciplinary findings [6, 7].

As noted in the literature, when used during the post-occupancy

stage, building engineering and social sciences can complement one another and offer helpful information on the human-building interactions. A few studies, however, combined data from these various fields. To the best of our knowledge, no paper has ever brought sociologists and engineers together to undertake sociological, energy, and LCA analyses on the same building. The impact of occupancy on building energy was also less frequently studied using immersive qualitative techniques like ethnography. Third, for a successful collaboration, languages and information should be shared and understood, as communication and comprehension across disciplines can be challenging. Communication issues between sociologists and engineers have not been addressed in the literature to far [8, 9].

Discussion

The suggested methodology was used on a rental multifamily home in France that complied with French criteria. Yet, the methodology—conducting discipline investigations followed by a cross-analysis—can be simply applied to different structures. Although though some disciplinary findings are still unique to the case study environment, knowledge from the cross-disciplinary research, and particularly the identified sites of convergence, will be useful to conduct additional multidisciplinary studies in various building types.

Conclusion

In this study, sociological, energy, and LCA research were used to evaluate the post-occupancy phase of a multifamily building, which was then followed by a cross-disciplinary analysis. The concept of using diverse viewpoints and disciplinary analyses at the size of one building served as the foundation for the overall strategy and the studies that were presented. This building's design and construction methods [10].

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Conflict of Interest

None.

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