Exploring Light Qualities in Sustainable Homes

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**Part of the PhD project: “A Method for Holistic Evaluation of Sustainable Buildings”**


**Project description of PhD project**

*A Method for Holistic Evaluation of Sustainable Buildings*

Interest in quantitative assessment of building performance has increased through the last decades in line with the technical and practical development of sustainable buildings. Now, various commercial tools are available to perform such evaluations. However, light, as an aesthetic and qualitative aspect of sustainable buildings has been neglected and underexplored. As a consequence, the focus is still mainly dedicated to technical aspects of sustainable buildings, but when it comes to aesthetic and qualitative aspects the field is rather unexplored.

**Research hypothesis**

Quantitative measurements on sustainable homes can help determine the energy consumption and energy production by proving and optimising their technical function in an efficient and functional environment. Qualitative measurements are aimed at measuring and exploring the experiences and satisfaction of occupants.

**Research methodology**

The research project consists of measuring, registering, analysing and comparing seven houses and occupants – through multi-disciplinary mixed methods sciences stretching from phenomenology and social science theory to measurements relying on natural and natural experience. The project focus on inter-disciplinary approaches compiling methods from various disciplines: Questionnaires for the occupants, Blogs written by occupants, Field research, Photographs, TimeLapse and Simulation.

In order to explore this new area a Mixed Methods approach is used through the use of methods from natural as well as recorded data for the occupants, their voices written by them. For exploration of light qualities and clarification of specifically what aspects to explore, a literature study in quality aspects of buildings and their occupants makes it possible to identify what parameters are central to develop sustainable buildings of the future and design methods for holistic evaluation of their future.

**Research hypothesis**

A method for holistic evaluation of sustainable buildings that is not only based on quantitative means. The question emerges of how we can determine and measure both quantitative and qualitative aspects of sustainable buildings without distorting the value of either of them.

**Research setup**

The research project consists in measuring, registering, analysing and comparing seven houses and occupants – through multi-disciplinary mixed methods sciences stretching from phenomenology and social science theory to measurements relying on natural and natural experience. Qualitative measurements are aimed at measuring and exploring the experiences and satisfaction of occupants, whereas quantitative measurements aim at measuring the building’s technical and functional aspects of light architecture. This work is an attempt to evidence and qualify aspects of the buildings’ technical and functional aspects of light architecture.

The PhD project is based on the hypothesis that the occupants experience that daylight and fresh air is a quality in the house.

**How can we determine light qualities in sustainable homes?**

Light is a complex matter embracing both technical, functional, and visible aspects, and in and integrated intelligently in the design of our future sustainable buildings. We know much of how we can improve it, but not so much of how we can integrate it into the technical and functional integrated light architecture. How can it come to subjective and qualitative aspects to explore problems of integration and development?

**Research methodology**

The method is a Mixed Methods approach (Creswell 2006) that equally considers quantitative and qualitative aspects and data. Case study Research (Yin 2009) methodology handles each house as an individual case and enabled the occupants to visit the house and provide their experiences that are recorded in a qualitative approach.

**Research hypothesis**

The project focuses on inter-disciplinary approaches compiling methods from various disciplines: Questionnaires for the occupants, Blogs written by occupants, Field research, Photographs, TimeLapse and Simulation.