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Living Labs in Architecture as Innovation Arenas within Higher Education Institutions

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Abstract

Education at schools of architecture must attend the demand for a new profile for architects, integrating and fostering corresponding SD competences through new learning methodologies, tools and concepts.

A series of recent developments in higher education, emerging fields of knowledge, as well as changing social and professional realities give relevance to the research on Living Labs in Architecture as new tools for a holistic Education for Sustainable Development (ESD) with a specific focus on renewable energies and Nearly Zero Energy Buildings.

On the other hand, a newly strengthened social responsibility of university towards society in the development of innovative solutions for our environmental, social and economic conflicts must lead towards new processes in teaching, research and technology transfer based on a strong interaction with their local and regional communities.

The LOW3 prototype solar house of UPC has been designed and built between 2008 and 2010 and converted and operated as a Living Lab for sustainable architecture and lifestyle since 2011 at the ETSAV campus at Sant Cugat del Vallès (Barcelona) under the responsibility of the author. This paper highlights the importance of Living Labs as innovation infrastructures in Higher Education and presents the specific educational experience of LOW3 within the institutional framework of UPC, drawing from 5 years of action research regarding pluralistic, experience based sustainability education.

It shows that the diversity of activities related to one single platform like Living Lab LOW3, allows the creation of synergies between actors, programs and projects. Stakeholders have the opportunity to participate in a community of users beyond established academic structures. In this sense, Living Labs in Higher Education can be seen as social ecosystems or Innovation Arenas with a link to the surrounding socio-economic context, fostering the creation of transversal educational communities.

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1. Background

Education at schools of architecture must attend the demand for a new profile for architects, integrating and fostering corresponding SD competences through new learning methodologies, tools and concepts (EDUCATE Project Partners 2012). A series of recent developments give relevance to the research on Living Labs in Architecture as new tools for a holistic Education for Sustainable Development (ESD) with a specific focus on renewable energies in housing and our daily lives:

- A new educational reality, with redefined objectives in higher education based on competence-based learning and a more transdisciplinary approach
- A new knowledge reality, with an urgent need for acquisition of new knowledge regarding specific subjects like low energy buildings, low-impact building materials and energy efficient technologies
- A new social reality, shifting towards participation, constant social innovations and a higher demand for environmental standards
- A new professional reality, requiring more interdisciplinarity, the ability to deal with complexity and uncertainty and new forms of project development processes based on collaboration

Important considerations regarding the essence of ESD are furthermore the understanding of sustainability as a (socially constructed) reality, “... as a dynamic and/or evolving concept, as controversial and the source of conflict”, and as a “catalyst for change” (Wals & Jickling 2002), which in consequence needs places for its collective negotiation and definition. This might require a new form of collaborative and empathic learning in order to develop a new collective “biospheric consciousness” (Rifkin 2011). Finally ESD seems to require so-called “transformative learning” based on psychological, convictional and finally behavioral transformation (Wiek et al. 2011, Boehnert 2012).

On the other hand a newly strengthened social responsibility of university towards society in the development of innovative solutions for our environmental, social and economic conflicts must lead towards new processes in teaching, research and technology transfer based on a strong interaction with their local and regional communities and society in general (Cortese 2003).

Living Labs seem to play here an interesting role as collaborative multi-stakeholder platforms.

2. Introduction

In the area of architecture, the ETSAV School of Architecture at Sant Cugat del Vallés can be considered a pioneering institution in understanding its campus and buildings as a laboratory to learn about energy efficiency in buildings, but also its community as an important stakeholder for a broader approach to sustainability regarding its socio-economic environment.

Solar Decathlon is an international competition for 20 selected universities to plan and build prototypes of energy self-sufficient solar houses. In 2008 a first ETSAV team under the lead of the author started the development of the first prototype solar house LOW3 at the campus in order to participate in the Solar Decathlon Europe 2010 competition in Madrid (Masseck 2011).

The LOW3 project (2008 - 2010) demonstrated over a 2 year period the importance and impact of a new way of education in architecture, based on the development and construction of a prototype house at the campus with a high degree of team self-organization, individual responsibility, and a strong link between teaching and research.
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