Higher education, universities and especially schools of architecture, have an important role and a specific potential in societies' transition towards sustainable development (SD). New forms of teaching and learning, fostering specific SD related competences through experience-based and participatory learning processes with a holistic, pluridisciplinary view on sustainability, can strengthen their role in this transformation process.

New approaches in the field of research and innovation like open innovation processes and Living Lab ecosystems can overlap with these advanced SD related teaching and learning activities to mutual benefit from generated synergies.

Based on these premises, the following hypothesis has been established:

Living Labs in Architecture can be efficient tools for teaching and learning about SD at universities, with focus on sustainable architecture and life style, besides their important role as infrastructures for applied research and collaborative innovation between university, companies and society.

As knowledge dissemination tools and activities platforms they can contribute to ESD and the outreach of university, fostering holistically the paradigm shift of society towards sustainability.

In order to conduct this research theoretical and practical approaches have been combined:

- In the first part theories of ESD and the phenomena of Living Labs in architecture are reviewed.
- In the second part case studies are presented in order to understand the historic development of prototype architecture related to research and teaching in sustainability and the recent appearance of Architecture Living Labs.
- In the third part similarities between the frameworks of ESD and Architecture Living Labs are identified and a classification tool for related projects is developed.
- In the fourth part the specific case study of Living Lab LOW3, an action research project of ETSAV (UPC), directed by the author, is documented and evaluated.

Overall objective is to contribute to the understanding of the role, which can have Living Lab projects in architecture for the necessary shift towards a participative and transdisciplinary educational model in the EHEA, which brings together theory and practice, teaching, research and innovation, fostering a holistic transition towards a more sustainable society.

The mayor findings of this work are the followings:

- Living Labs enclose diverse projects or initiatives, which have in common some specific characteristics, but differ widely in applied methodologies and tools according to their objectives, stakeholders and context among many other factors.
- Tools for their classification can contribute to the understanding of their characteristics and potential in different disciplines e.g. architecture as well as in a specific context like higher education.
- ESD education for architects and related disciplines seem to benefit from the concept of Living Labs in architecture as this type of projects allow the application of specific teaching and learning methodologies, which foster ESD skills and abilities and competences.
- Field studies of Living Lab projects in architecture show a series of strength and weaknesses of the concept regarding organization and management, integration into the established academic settings or sustainability of projects over time, which need to be addressed and overcome in order to more widely integrate Living Labs as educational tools in HE in the future.