TEACHING SUSTAINABLE APPROACH IN ARCHITECTURE SCHOOL

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Summary

Faculty of Architecture is changing its approach to the sustainability issues. Sustainability will be seen as an integral part of design projects on many different levels. The teachers will develop appropriate teaching methods combining technical knowledge with aesthetical experience. For different phases of the study new types of building briefs need to be developed. The final goal is to change the students' sensitivity to the environmental issues.

Keywords: sustainability, architecture school, design projects

1 History of teaching sustainable approach on FA CTU

For the last 20 years, teaching of the sustainable development at the CTU, Faculty of Architecture has been on the level of the "master approach", emphasizing mainly an individual approach to the students' creative abilities.

While in other, geographically close architectural schools e.g. Fakulta architektúry STU, (Slovak University of Technology, Bratislava), or Fakultät für Architektur und Raumplanung (Technische Universität Wien) teaching of sustainable architecture has been provided by specialized institutes, (Ústav ekologickej a experimentálnej architektúry, Institut für Architekturwissenschaften - Bauphysik und Bauökologie), it has been rather spontaneous on the CTU, Faculty of Architecture. Mainly it had taken place in studios led by teachers with personal architectural experience in green building realizations.

2 Change of sustainable architecture teaching system

Since 2008, FA has been undergoing a systematic change of its sustainable architecture teaching system as well as creating logic ties between individual subjects, based on the confrontation of previous FA teaching style and experiences from architectural schools abroad. This change has been taking place at several levels: bachelor and masters's degree courses, studio work, PhD programme and research.

2.1 Bachelor degree courses

Creating "Building ecology", a new requisite course in the first year of a bachelor degree study, is one of the keystones of the restructuring process. This course will introduce sustainable building topic to the first year students, in order for them to be able to verify the principles of the integral design within the framework of the first studio projects, mainly in Basics of Architectural Design I. and II., Residential building studio and Public buildings studio. The course covers the history and philosophy of sustainable development, the relationship between human and the environment, architectural and energetic building concepts including designing methods, healthy interior environment, natural building materials, geopathogenic zones, greenery, transportation, social and economic aspects.

2.2 Masters' degree courses

Individual topics of the bachelor degree study - regional and landscape planning, ecology, social ecology, low-energy and passive buildings, renewable natural resources, healthy buildings, geopathogenic zones and others are further developed throughout requisite and elective courses of the master's degree and studio work.

For education purposes Lecture notes "Health and Beauty – Natural Materials and Healthy Buildings" were published at the Faculty of Architecture [1]. The lecture notes regard architecture from the philosophic and aesthetic point of view and in regards to sustainable and healthy development.

2.3 Studio work

2.3.1 ZAN (Basics of Architectural Design)

Integral part of the ZAN course is an introduction to the basic principles of sustainable design and its vocabulary. Analysis of existing "Green architecture" projects is combined with limited design exercises and excursions.

2.3.2 Architectural Studios (bachelor degree)

During the architectural studios (bachelor degree) the student can verify sustainability principles on residential and public buildings of smaller scale and small urban design. This includes "10 elements of sustainable design" including an energy scheme. Prepared formulas enable the students to understand and evaluate basic principles of sustainable design, including the A/V ratio, passive and active solar technologies or thermal balance of the building. Final evaluation tests the combination of architectural concept with energy concept and use of materials.

2.3.3 Architectural Studios (master's degree)

The main topic during the master's degree studios is an integral design in projects of larger scale and town planning. It includes solar architecture in new buildings and reconstructions of existing ones. Students are encouraged to test sustainable principles on buildings of larger scale – this includes using special-purpose software. Using case studies and essays on different aspects of sustainable design supports these practical exercises. The students' work outcome is published on Greenlab webpage [2]. Its' main purpose is to collect useful information on sustainable development, and also to enable the students to publish pieces of knowledge they gained through their studies.

Fig. 1 Ecological Activity and Education Centre, exterior view; Author: Lucie Kirovová [3]

Fig. 2 Ecological Activity and Education Centre, interior view; Author: Lucie Kirovová [3]

2.4 PhD programme

In the past few years, the sustainability issue has been among the fundamental topics of the FA interests. It permeates all four PhD fields of specialization, all the way from the Theory of Architectural Design to Urban Design and Planning, History of Architecture and Monument Conservation and Architecture and Civil Engineering. Among the PhD topics we can find e.g.:

- Natural building and timeless environmental values of historic architecture
- The past as an inspiration for sustainable development and ecology
- Tendencies of sustainable architecture
- Energetic and ecologic aspects of buildings and their influence on architectural design
- Healthy buildings
- Natural building materials

The PhD students participate in teaching within the bachelor and master's studies and thus in interconnecting their thesis topics with tuition.

2.5 Research

The Research Centre for Industrial Heritage (VCPD) is an integral part of the Faculty research policy. VCPD is an industrial heritage and brownfield regeneration reference workplace. It also comprises a Register of Industrial Heritage for Sustainable Growth.

Other FA research activities include research and elaboration of case studies and the creation of a sustainable projects database. An upcoming research by virtue of research by design combined with design research and case studies methods on the Ecologic Residential Buildings topic is also included. Design of a residential complex will be the key-stone of the narrow cooperation between the PhD students and teachers. On it, different levels of sustainability in dependence on the project program, the election of building types, different material options and retrospectively on the overall design and architectural expression of the building will be tested.

Fig. 3 Example of a case study elaborated for tuition purposes: Eulachhof housing estate, Winterthur, Switzerland; source: GlassX Architektur [4]

3 Conclusions

The CTU, Faculty of Architecture emphasizes the meaning of Sustainable development only in the last few years, but the interest of students and teachers in this issue grows exponentially. The goal of FA is to systematically intensify its' students' motivation to implement ecologic principals of architecture into the architectural design in compliance with the improvement of quality of life and therefore increasing the quality of education on the CTU, Faculty of Architecture.

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