CERIS : Civil Engineering Research and Innovation for Sustainability

Back2Future – Building with Sustainable Local Traditional Materials

Summary

From 1880s two new building materials, steel and concrete, have been introduced, replacing traditional and locally produced materials, such as clay, wood, stone, straw, cork, etc. Steel and concrete are advanced materials, but they also embodied with a great amount of energy and greenhouse gas emissions in their production process. The statistics show that almost 50% of CO2 emissions are related to the building industry sector. Moreover, with the rapid increase of the Earth's population, over 3 billion people will need a new home in the next 50 years. In order to solve the aforementioned problems, project Back2Future will introduce a strategy for implementing sustainable traditional local sourced materials containing recycled and industrial waste products into the building industry sector through education of HE students. The project will fully comply with EU Commissions' innovative laws for the reduction of greenhouse gas emissions and net zero carbon (CO_2) targets for 2030 and 2050. The countries participating in the project, Portugal, Denmark, Lithuania, Poland and Greece, will provide a good balance and a cross-section of the EU regarding building traditions and climate. Project Back2Future aims at development and delivery of an innovative trans-disciplinary e-learning course "Building with Sustainable Local Traditional Materials" by using student centered project based learning, learning by doing and blended learning approaches. Objectives are:

- To introduce innovative educational methodology, based on student-centered project based learning, learning by doing and blended learning approaches.
- To develop and deliver a new trans-disciplinary e-learning course on building with sustainable local traditional materials.
- To educate and to provide practical skills/experience and knowledge to all participants (students, teachers, entrepreneurs) in sustainable locally produced building materials and buildability methods.
- To ensure an open awareness of the project results and to introduce adapted traditional, national and local sustainable materials back into the construction sector in the EU, upgrading them for today's and future demands.

The main target groups are higher education institutions, in particular teachers and BSc/BA students, whose specialization is directly related to architecture, design, civil engineering, construction technology or similar subjects. Moreover, it is envisaged that the project will be relevant for business companies and will foster further development of sustainable construction with local building materials.

Four intellectual outputs will be developed: 1) Educational Methodology; 2) E-Learning Course "Building with Sustainable Local Traditional Materials" (9 ECTS); 3) E-Learning Platform; 4) Best Practices in Building with Local Traditional Materials.

Teachers will participate in an intensive training course in Denmark, where competences on innovative project based learning, learning by doing and blended learning approaches will be developed. New trans-disciplinary e-learning course and e-learning platform will be jointly developed by partners from five countries in consultation with business enterprises. The new course will be tested in three intensive learning/teaching courses that will take place in Portugal, Lithuania and Poland. International building and construction project phases, which are used in most EU countries, will be adapted in the project as a main template, namely Brief phase, Outline Proposal, Scheme Design, Detail 1 and Detail 2 phases. Students will gain innovative trans-disciplinary knowledge in sustainable construction with local materials; using innovative learning approaches, they will develop their research, teamwork, communication and cooperation, creative thinking, problem-solving skills required in modern daily work environment.

Stakeholders whose activities are related to construction, i.e. associations and private enterprises, will be involved in the development of the new course; therefore, they will have an opportunity to share their expertise and include the topics that will help to acquire competences, required in labor market. In this way collaboration between academic and business sector will be strengthened. International and local participants from HEIs, educational authorities and business companies will attend the international conference in Greece, where innovative intellectual outputs will be presented. It will result in increased public awareness about the outputs of the project.

Figure 1. Teachers and students of a Back2Future intensive training course in NOVA School of Science and Technology, Caparica, in November 2021.

Project Reference

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Leading Institution

NOVA University of Lisbon (Portugal)

Partners

VIA University College (Denmark), VILNIUS TECH – Vilnius Gediminas Technical University (Lithuania), KTU – Politechnika Krakowska (Poland), Kauno Technologijos Universitetas (Lithuania), Aristotle University of Thessaloniki (Greece), Study and Consulting Center (Lithuania)

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Project Website

sites.google.com/fct.unl.pt/back2future/home