IEEE EDUCON 2025 Co-design workshop

An expedition semester for engineering students to be future energy sovereignty key players

Overview

Decarbonization is a major objective of the European Union, which aims to achieve carbon neutrality by 2050. Decarbonization concerns all sectors of the economy. The success of a decarbonization strategy requires coordinated action at all levels, in particular higher education institutions through their science and technology curricula when preparing the next generation of engineers.

After 10 minutes presentation of the context of the one-hour active workshop, participants in groups of 5-7 elaborate on and design the structure and curriculum of a joint European semester, part of an engineering curriculum at Master level with significant international dimensions. The context is a 5-month expedition in an imagined cruise ship, which provides accommodation for the students and is equipped with learning and teaching workspaces, traveling between several coastal European cities to visit both universities and large energy companies. The participants draw on a map the itinerary of the low-carbon cruise ship, a real mobile learning lab, visiting at least 5-7 universities and 5-7 companies around Europe, and sketch out an original joint curriculum with the aid of a canvas of nine components (cf. Figures). The components of the curriculum include: main goals and learning outcomes of the program, entry requirements, structure and contents of the program, teaching and learning methods, location of teaching and learning, interpersonal skills, assessment methods, language of instruction, and ethno- and sociographic aspects, including diversity and equity. Some parts are already prefilled, like learning outcomes, goals and structure. At the end of the workshop session, participants engage in a semi-structured discussion on current educational practices and potential future directions. No prior knowledge is needed for the workshop, even no expertise in energy training, just openness to innovative ideas in curriculum design.

The workshop provides an opportunity for engineering program designers, educational leaders and teachers at the IEEE EDUCON 2025 conference, to exchange innovative perspectives on an exciting semester of engineering training.

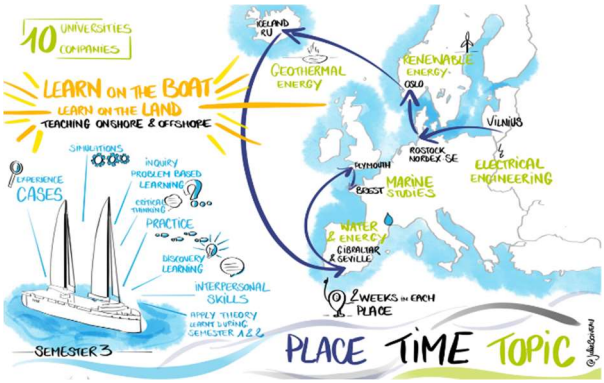

Fig. 1. Overall workshop context.

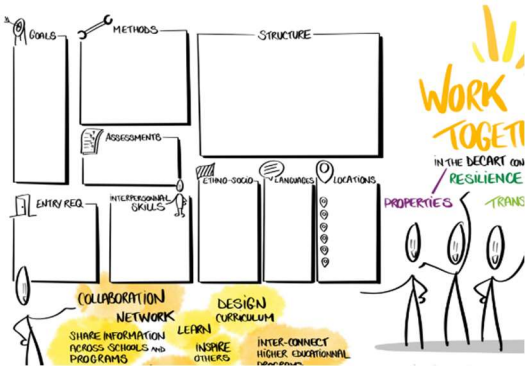

Fig. 2. Components of the curriculum canvas.

Conference topics:

The workshop meets some IEEE EDUCON 2025 topics, such as (i) Future-oriented and Personalized Educational Concepts, as Student-centered Learning Environments thanks to the proposed expedition learning model, (ii) Ethical Challenge as sovereignty emerges as an important topic with lots of controversies and geopolitical dimensions, (iii) Multidisciplinary and Transdisciplinary Education as investigating a pan-European semester, where energy topics are strongly systemic and at the frontiers of various domains, including social, (iv) Remote Labs and Classrooms, as a low-carbon cruise ship is to be a living laboratory, and (v) Education in the Industry 5.0 era, as the proposed semester is in strong connection with large industries.

Fig. 3. Itinerary analysis.

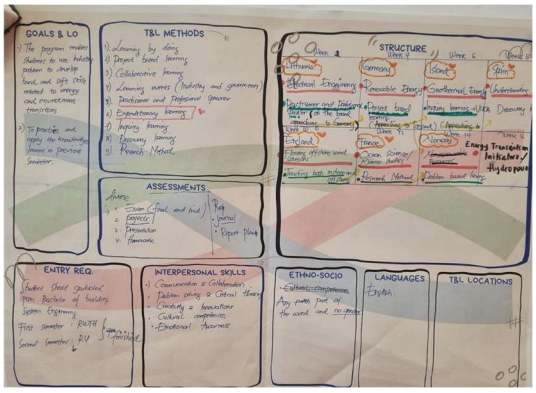

Fig. 2. Curriculum proposal canvased.