Developing *future-scaffolding skills* through physics teaching at the secondary school level: The I SEE European project

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How can physics teaching contribute to developing competencies for pushing imagination forward and to manage, rationally and emotionally, students' uncertainty about the future? In this talk, we address this question by presenting a teaching module on climate change designed to develop what we termed "future-scaffolding skills". The notion includes concepts that come from the science of complex systems and that can be turned into abilities to construct visions of the future that support possible ways of acting in the present with one's eye on the horizon. We refer, for example, to the concepts of "space of possibilities", "future scenarios", "projection instead of deterministic prediction", "feedback and circular causality". Our notion of "future-scaffolding skills" includes also transversal skills that labour market requires and that, meanwhile, can support students to push imagination toward the future. Future-scaffolding skills contain, for example: strategic thinking and planning, risk taking, possibilities thinking, managing uncertainty, creative thinking, modelling and argumentation. In the talk, we will present the module, as well as the pilot study we carried out to test if the module effectively impacted students' views of future. The module has been implemented with secondary school students (17 years old) from a scientifically-oriented secondary school in Italy (grade 12). The main result concerns the change in the perception of future that students' discourse reveals: from far and unimaginable, it became thinkable as a bunch of possibilities, addressable through concrete actions and at their reach, in the sense that they found room to see themselves agents of their own future. The positive results inspired the Erasmus + Project "I SEE – Inclusive STEM Education to Enhance the capacity to aspire and to imagine future careers", that started in September 2016 and involves 7 partners from 4 different countries.

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