**I SEE – Inclusive STEM Education to Enhance the capacity to aspire and imagine future careers**

The strategic partnership will develop innovative teaching-learning modules and guidelines for supporting secondary school students’ aspiration and imagination towards the future. Our inclusive, future-oriented approach addresses the acute problems of European societies related to science education: the decrease in student interest in pursuing STEM (Science-Technology-Engineering-Mathematics) careers and the “skill-gap” between school learning and labour market needs.

Underlying these problems and challenges is students’ difficulty in projecting themselves into the future as responsible and active persons, citizens and professionals. While the problem touches the whole generation, especially the migrant youths coming from different cultures and difficult experiences face challenges in finding themselves in their new context and in imagining their future.

In order to foster such capacities, our strategic partnership creates novel ways to value STEM themes as disciplinary ground to develop *future-scaffolding skills* of all upper secondary school students (ages 16-19). These skills include strategic thinking and planning, risk taking, thinking beyond the realm of possibilities, action competence, managing uncertainty and creative thinking.

The strategic partnership will develop “I SEE” modules on cross-cutting and societally relevant fields such as climate change or nanotechnology. A module consists of materials and a manual for teachers and students on activities both in the classroom and in out-of-school settings. The start-up module developed during the first year will be implemented, tested and refined in the Summer School which will host a culturally diverse group of students from three countries as well as teachers, educational researchers and other stakeholders. On the basis of the discussions and results, the partners develop three “I SEE” modules through a multiple back a forth process of design, cross-test and refinement that will run over the second and the third year.

In addition to “I SEE” modules, the outputs of the project include a guide for developing further I SEE modules, case studies, and recommendations for inclusive STEM education to enhance the capacity to aspire. The materials will be provided both in electronic form and in print, and made publicly available through the web-site and the e-Twinning platform. To increase the impact, national and international multiplier events will be organized in four countries.

**Key-words:** Science education; Soft-skills & employability; “Alternanza scuola-lavoro”; Multiculturalism, gender & equity; Multidisciplinary; Future & Imagination.

**Strategic partnership (SP):**

* Alma Mater Studiorum - Università di Bologna (coordinator)
* University of Helsinki & Normal Lyceum, Helsinki
* Icelandic Environment Association (IEA)
* Liceo A. Einstein, Rimini
* Hamrahlid College, Reykjavik
* Fondazione Golinelli, Bologna
* Association for Science Education (ASE), London

The SP consists of three secondary schools, two universities, an environmental NGO, a teachers’ association and a private foundation. The partners are from four European countries: Italy, Finland, Iceland and the United Kingdom. The SP grounds on two well-established and effective school-university partnerships: one between the Liceo A. Einstein and the Department of Physics of the University of Bologna (UNIBO), and the other between Helsinki Normal Lyceum and the Department of Physics of the University of Helsinki (UH). The Icelandic Environment Association (IEA) brings to the SP their expertise in environmental and sustainability education and the action competence approach. Hamrahlid College in Iceland adds to the cultural diversity of students and teachers participating in the project. The partnership between the three schools in Helsinki, Reykjavik and Rimini is projected to be fruitful in terms of cultural exchange and the generalisability of the results. Both aspects are boosted also by the Association for Science Education (ASE) who brings added value through their extensive school and teacher network in the UK. In order to connect school science to competences needed in the labour market, the Fondazione Golinelli (FG) in Bologna, Italy, joins the partnership.

The project will pursue the following results and will organize the following activities:

**Intellectual outputs**

O1. **“I SEE” start-up module** (to be tested in the Summer school) (month 12);

O2. **Three (implemented) “I SEE” modules** tested in at least two different Countries and two different cultural contexts (month 13-36);

O3. **I SEE module guide** to develop further I SEE modules (month 13-33);

O4. **Case studies** to evaluate the potential of the I SEE modules to enhance students’ capacity to aspire to and to imagine their future through inclusive activities in science education (month 6-30);

O5. **Recommendations** for crossing the barriers between schools and society (month 25-33).

**Teaching & learning activities**

1. Summer school for 25 secondary school students (16-19 year old) (June 2017) where a draft module will be implemented and tested;
2. Workshops for 6 teachers and 8 researchers of the I SEE partners. The workshop will be realised at the same time of the summer school (June 2017) and during the workshop teachers and researchers will follow and analyse the implementation.

**Multiplier events**

1. Local pre-service and in-service teacher training events;
2. National workshops for dissemination (at least one per Country during the second or the third year);
3. International workshops for dissemination (Organized in UK by ASE).

**“OBJECTIVES TREE”**

**General objectives:**

GO1: Contribute to innovating science teaching at the level of upper secondary school students (grades 11-13, 16-19 years old) in order to facilitate scientific literacy and employability in a changing, multicultural and fragile world.

GO2: Contribute to addressing the societal issues represented by the STEM skill gap and professional shortage.

GO3: Contribute to innovating teaching methods to make science teaching inclusive and supportive of cultural diversity.

**Key-idea:**

The difficulty of students to project themselves in the future as persons, citizens and professionals is at the core of many societal issues addressed here (STEM professional shortage, lack of inclusiveness, lack of personal, social and vocational relevance of school science, namely school science does not contribute students to “see” their future and to take accountability for that)

**Expected results**

The expected results are the specific contributions that the project will provide to the general objectives (GOs). The expected results will be achieved through the design, implementation and dissemination of its Intellectual Outputs (O1, O2, O3, O4, O5).

ExR1 – contribute to innovating science teaching so as to make it relevant from a scientific, professional, social and personal point of view and effective for supporting diverse students to “see” their future and to take responsibility for it (O1, O2, O3, O4);

ExR2 – contribute to addressing the “skill gap” by offering examples of how professional skills can be developed in science classes, without missing inclusiveness and a special attention to the societal implications of science, adhering the principles of Responsible Research and Innovation issues (O4, O5).

ExR3 – develop future-scaffolding skills in upper secondary school students, so as to increase students’ individual growth and employability, by enhancing their capacity to aspire and to imagine possible future scenarios for them (O1, O2, O3, O4);

ExR4 – improve students’ scientific knowledge about socio-scientific issues (e.g. climate change, applications of quantum physics and nano-technologies) (O1, O2, O3);

ExR5 – update secondary school teachers’ knowledge, ability and competences about advanced contemporary scientific topics (like climate change, quantum physics applications and nano-technologies) (O1, O2);

ExR6 – employ action competence in an innovative way, as future-scaffolding teaching methods able to promote inclusiveness, active and future-oriented learning (O3).