I SEE project: An overview

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Kick off meeting

Helsinki, 12-14 October 2016

STRATEGIC PARTNERSHIP

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

The priorities in the call

- *STEM shortage* as consequence of the lack of relevance of school science (Stuckey at al, 2013): Europe is suffering from an alarming decrease in student interest in pursuing STEM careers (EC/EACEA/Eurydice, 2012).
- *Skill gap*: STEM-based industry leaders extensively complain that schools do not support the formation of the skills that the labour market needs.
- *Scientific literacy*: Besides the STEM workforce, societies need citizens with *scientific literacy* (Roberts, 2007) – i.e. the skills necessary to identify, to form opinions about and to make reasoned decisions on personal, social, and global issues related to science and technology.
- *Inclusiveness*: the social change with unprecedented flows of migrants to the region (OECD, 2015) imply society to need education that acknowledges diversity.

Our analysis of the needs

*Behind the priorities there is a bigger and deeper problem: students' difficulty in projecting themselves into the **future** as responsible and active persons, citizens and professionals.*

- *global problems like climate change, ecosystem degradation and economical and political crises* make future unpredictable and it is perceived no longer as a promise but as a threat (Benasayag & Schmit, 2005).
- many young people feel marginalised or excluded from economic and social life by the *crises* (European Parliament Flash Eurobarometer (EP EB395), 2014). In such a context, the young generation have difficulty in projecting themselves into the future, and in developing scope as future professionals.
- *social acceleration* is source of anxiety and frenetic standstill (Rosa, 2013).
- whereas for past generations science and technology were seen as positive possibilities for addressing health or climate challenges, now students perceive them as sources themselves of fears and global problems (Benasayag & Schmit, 2005).
- The capacity to aspire is a *cultural fact* (Appadurai, 2004).

Future does not act longer as positive force to plan the present and to look at the past.

The key-hypothesis and the goal of the project

Making STEM careers more attractive for *all the* students means:

- to support them to cope rationally and emotionally with the present and future;
- to enable them to build progressively a future perspective where STEM careers are possibilities to pursue by developing authentic conceptual, epistemological and professional competences.

Goal: *To design innovative approaches and teaching modules on scientific topics aimed to foster students' capacities to imagine the future and aspire to STEM careers.*

The key-ideas

1. Focusing our module design on *future scaffolding skills*

"Future-scaffolding skills": skills like *strategic thinking and planning, risk taking, thinking beyond the realm of possibilities, managing uncertainty, creative thinking, modelling and argumentation.*

Such skills are:

- also known as competencies to anticipate* future (driver to enhance students' capacity to aspire, envisage themselves as agents of change and push their imagination towards future careers in STEM)
- required by labour market (skill-gap)
- scientifically and socially relevant
- gendered and culturally dependent.

(*) not to forecast or predict future but to think of and to talk about it (**Laura's talk**).

The key-ideas

2. Multi-dimensional (integrated) perspective to design MODULES

The societal aim to develop professional skills cannot be however detached from the social aim to foster students' *identity as persons and citizens in a global, fragile and changing world.*

Our modules have to integrate the different dimensions (conceptual, epistemological, professional, societal, cultural and personal) through an innovative design and an accurate process of educational reconstruction (an example in **Giulia's talk***)*

The key-ideas

3. Focusing our teaching approach on a special method: ACTION COMPETENCE

*Action competence will be implemented **in an innovative way**, as future-scaffolding teaching methods able to promote inclusiveness, active and future-oriented learning* (**Caitlin's talk**)

The expected results

The Expected results to be achieved through the design, implementation and dissemination of its Intellectual Outputs (O1, O2, O3, O4, O5) are:

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).

The “concrete spirit” of Erasmus +

- Intellectual Outputs
- Teaching/learning activities
- Multiplier events
- Other tangible products/results

Intellectual outputs

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

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

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

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**) (res. UNIBO);

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

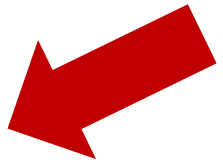
Teaching & learning activities

- Summer school for 25 secondary school students (16-19 year old) (**June 2017**) where a draft module will be implemented and tested;
- 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

- 4 National workshops for dissemination (at least one per Country during the second or the third year) (E1-E4);
- International workshop for dissemination (E5) (Organized in UK by ASE)

Other tangible products/results



- Web site
- Dissemination plan (and dissemination events)
- Evaluation plan

Goals of the Kick-off meeting

- To know each other, start sharing ideas and perspectives and have fun (*social/personal dimension*)
- To share some key ideas of the project (*scientific dimension*)
  - *how can we incorporate competences of FUTURE into STEM education?*
  - *what are the teaching methodologies called ACTION COMPETENCE & EXPOSURE and how can we use them?*
  - *What do we mean by MODULE and what should characterize our I SEE modules?*
- To share the “Erasmus +” reporting and budgeting philosophy (*administrative/management dimension*)
- To learn to work, operationally, together by focusing on specific and urgent tasks: making some decisions about the first module (O1), about the organization of teaching/learning activities (C1, C2), and planning next steps (*operational dimension*).
- To discuss about the Partnership agreement (scientific, social, management and operational dimensions)

Organization of the Kick-off meeting

Any question on the program or perplexities?

References

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