



science4girls

Making science attractive to female students through open science schooling focused on climate change

Guidance Collection for Partners

METHODOLOGY

[Present graphics used until the project has developed its own graphics]

Despite more than 30 years of focus on 'enthusing, fascinating or encouraging' girls into STEM, there has been NO CHANGE in the proportion of girls choosing physics A-level. It is clear that one-off interventions do not work. Initiatives that seek to 'encourage' girls into STEM by implying that girls must change to fit into the science world are misplaced.

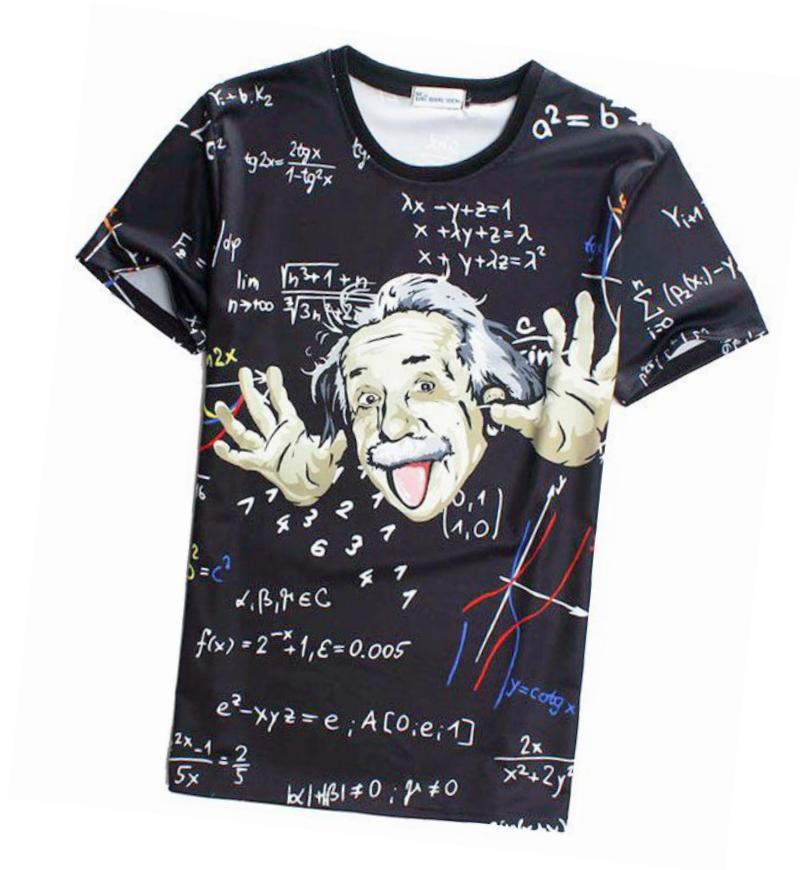
Competitions are also a risk. Girls do not need competition to motivate them and are often more inspired by cooperative activity. And simply being a woman who works in STEM does not make someone an effective role model. Some role models are 'too perfect' and are therefore off-putting. For a girl, enjoying, being interested or being good at a subject is not enough to persuade her to continue studying it – she has to be convinced that it has a value for her future and does not limit her future options.

"Not for people like me?" WISE, UK 2014

The project will apply a very solid and several-times-tested double methodology, covering the two main components: climate change missions and Open schooling.

The CLIMATE MISSION-BASED LEARNING METHODOLOGY covers the depths and qualities of female students creating new science images (vertical dimension), while the DYNAMIC PROGRESSION covers how the OSS methodology moves the project towards its final results (horizontal dimension).

Both methodologies are mutually reinforcing.



1



THE CLIMATE MISSION-BASED LEARNING METHOD

It covers the questions: how will the practical experimentation be carried out? How will the teachers and girls work in the community missions? How will the girls engage in climate change prevention?

The climate mission-based learning methodology will ensure that:

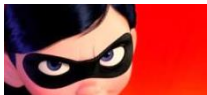
- The produced experience, on which the knowledge creation will be based, is created through in-depth and long-term practice
- The practical experience will be created by science teachers and female students
- The girls' missions address important local climate change challenges, important to themselves as well as to the community
- The girls will learn science in different ways than in traditional instruction, and they will document this new experience with creative media
- The missions are powerful enough to create fundamentally new images of science among the girls

The climate mission-based learning can be characterized by:

- The students work in teams of 4-5 girls, strongly supported and guided by their teachers
- The girls explore the community and identify the most important climate change challenges in the community in which they take a personal interest
- The girls select the most important and interesting real-life climate change challenges and design their missions in collaboration with community resources; mission design includes:
what do we wish to accomplish?
- the girls work through missions, supported by their teachers and the collaborating community
- The teams document their experience with creative media
- The girls seek to accomplish the missions to the extent possible and to make an effort to ensure that the missions are continued
- The teachers and community collaborators organise time-out science knowledge sessions for the girls when needed

A full climate change mission is expected to last 4-5 months.

2



THE DYNAMIC PROGRESSION METHOD

The open schooling progression covers the questions: how will the project organise its activities in time and phases to ensure a solid progression towards its final results, including towards the guidance and inspiration material to science teachers from across the EU?

The clear mission is to ensure that:

- The final IOs are based on accumulated practical experience

- The knowledge production and from which the final IOs are created, is able to capture and articulate the essence of the practice
- The final IOs therefore bear strong marks of the co-creation of science and girls

All this is to deliver as attractive, authentic and relevant guidance material to science teachers from the EU as possible.

The methodology's practice/knowledge interplay and dynamics is governed by the exponential progression towards its final results, illustrated briefly like this – presenting at the same time the PROGRESSION LOGIC and its operationalisation into the WORK PROGRAMME:

- Production of preliminary practical guidance for teachers and girls, based on knowledge available
- First round of missions, based on this guidance and including time-out learning sessions as needed
- Collective evaluation and lessons learned, on which the advanced guidance for Round 2 will be based / first knowledge creation from practice
- Second round of missions, including learning sessions as needed and including linking to online climate change resources (think global – act local)
- Collective evaluation and lessons learned on which the developed knowledge creation will be based
- Production and sharing of final results / Sustainability measures



The project's special focus on teenage girl's identity formation

Several decades' attempts to make science education and a life in science more attractive to young female students have not been successful.

This is why the biggest practical research project in Europe, the WISE project in the UK, ended up in 2014 saying:
NOTHING HAS WORKED.

The clear conclusion is that there is nothing wrong with the girls, but a lot wrong with science education in secondary school.

Therefore, an increasingly evident conclusion is that the girls should not change, science education should.

Girls should not have to become boys-like to engage in science.

This means that strategies to change the girls' mind about science need to change science education and need to be powerful enough to integrate in teenage girls' female identities.

The project's engagement methodology has been used successfully and evaluated positively in other secondary school projects, and one of the aims of the methodology is to give answers to the extremely important questions:

-Which are the core values in teenage girls' identity development that new science strategies need to link deeply to?

-What should, then, be the characteristics of innovative science education strategies that will be considered attractive by the girls?

Climate change based open science schooling is expected to be able to create such new science images that science learning and a life in science become more integrable into the girls' identity – because it breaks away from the basic parameters of traditional science instruction, it goes far beyond superficial “modernizations” - and in a radical way links strongly to very many teenage girls values and preferences.

This is so, because this science learning strategy does not merely link to one or two of the typical female preferences, but to almost all of them; and the combination of these preferences is what makes the strategy powerful and promising.

SCIENCE4GIRLS METHODOLOGY ILLUSTRATED

