

## **Inspiring our future citizens and scientists: follow the Blue Paths (Percorsi nel Blu)!**

Erika Mioni (1), Mascha Stroobant (2), Silvia Merlino (3), and Roberto Traverso (4)

(1) Istituto Comprensivo Statale n.2, Complesso 2 Giugno (I.S.A. 2 - "2 GIUGNO") Viale Aldo Ferrari - 19121 La Spezia - Italy (erika.mioni@gmail.com), (2) Distretto Ligure delle Tecnologie Marine (DLTM) Via delle Pianazze n. 74 - 19136 La Spezia - Italy (mascha.stroobant@dltm.it), (3) Consiglio Nazionale delle Ricerche – Istituto di Scienze Marine (CNR-ISMAR) U.O.S. di Pozzuolo di Lerici, c/o Forte Santa Teresa - Loc. Pozzuolo di Lerici - 19032 Lerici, La Spezia – Italy (silvia.merlino@sp.ismar.cnr.it), (4) Istituto Comprensivo Statale n.6, "Ubaldo Mazzini" (I.S.A. 6) Piazza Verdi n. 13 - 19124 La Spezia - Italy (oglasa@libero.it)

Very often we hear about scientific communication and education as separate and disconnected domains: in fact while the first one is seen more as a moment of disclosure for disseminating results and latest achievements and consequences (a look to our direct future), the second is, instead, identified as a formative moment in the long term, that often is based on obsolete and dated programs that refer to the past.

What would happen if these two domains were, instead, considered as inseparable? As stated by Andrea Schleicher (OECD): "Schools have to prepare students for jobs that have not yet been created, technologies that have not yet been invented and problems that we don't know will arise."

How to manage this challenge?

The European Commission has proposed seven recommendations to follow for improving Science education and to bring more and more young people closer to STEM (Science, Technology, Engineering and Mathematics) disciplines. Especially three of them (Recommendation n. 1, 4 and 7) pin out the to-do list for improving communication and education in Science, indicating that "a primary goal of science education across the EU should be to educate students both about the major explanations of the material world that science offers and about the way science works. Moreover teachers of science of the highest quality should be provided for students in primary and lower secondary school; moreover the emphasis in science education before 14 should be on engaging students with science and scientific phenomena (extended investigative work and 'hands-on' experimentation and not through a stress on the acquisition of canonical concepts). Last but not least: good quality teachers, with up to date knowledge and skills, are the foundation of any system of formal science education. Systems to ensure the recruitment, retention and continuous professional training of such individuals must be a policy priority in Europe".

Blue Paths (Percorsi nel Blu) is a transversal project of Biological Sciences, carried out in a pilot school of La Spezia (ISA 2 "2 Giugno"), and that since several years involves students aged 4 to 18 years (and their families) in a long-term training program for environmental awareness and marine scientific research. The project is aimed at monitoring marine biocenosis (flora and fauna) from the upper and middle shore, using and integrating the Reef-Check Protocol (C.E.M. Coastal Environment Monitoring Protocol) with a new approach that motivates students to science, continuously over the years and bringing them closer to the work of Marine Scientists, raising awareness on biodiversity loss and the pollution within a specific area such as that of the Pelagos Sanctuary in the North Tyrrhenian and Ligurian Seas.

Blue Paths (Percorsi nel Blu) is, hence, an example of education with a wider communication spectrum (not focused only to form a single class of students, but a whole community) and made possible thanks to a network of partners (including technology clusters, Institutions, Museums, Research Centers, Marine Protected Areas etc.).

The presence of the network has allowed the enhancement of the Project under different points of view, including:  
- transformation in a participatory research project (the scientific results obtained by students are real products of research) of citizen science;

- increase of educational opportunities (peer education, intergenerational education, tutoring);  
- increased visibility thanks to the participation in European projects for the Science Communication (European

Researchers' Night project funded by the European Commission under the Marie Skłodowska-Curie actions);  
- enrichment of students' curriculum thanks to an adequate and real acquisition of key skills for future careers that can also inspire their actions as future citizens.