



Global Junior Challenge

Projects to share the future

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Leading the dance of Science

Nome dell'ente che lo ha realizzato /ORGANIZATION/INSTITUTE PRESENTING THE PROJECT: *:

Epitalion Ilias Primary School

Regione/Region: Iliia, Peloponnese

Paese/ Country: Greece

Città/ City: Pyrgos Ilias

Descrizione del progetto/Describe the project :

In Greece, before 2016, there was not any chance for primary school teachers neither to attend a training program at CERN nor to participate in the development of similar educational activities. This opportunity existed only for secondary school teachers. But since 2016, the conditions for something similar have been created. The inspiration came from Mrs. Tina Nantsou, a physicist at Hill Private Primary School in Athens. She developed and applied school activities on teaching Physics in a friendly and innovative way, using very simple and everyday materials and she gave the title: "Playing with Protons". She is also the pedagogical advisor of the program. Her idea was embraced and facilitated by Dr. Angelos Alexopoulos, Education & Outreach Officer (CERN-CMS). So, every summer from 2016 until today, 10 finalists are selected among hundreds of applications, according to their high academic criteria and their successful Skype interview from CERN's special jury in order to take part in the final training event at the Idea Square and the other facilities in CERN (CMS, ATLAS, GLOBE, MICROCOSM). I had the great honor to participate at the 2nd edition of the program in August 2017. Afterwards, I decided to create a website and a channel on YouTube not only to describe my experience at CERN or just to apply what I learned there, but taking it a step further, developing brand new activities and evolving new ideas with my students, considering their imagination and creativity in practice. This is also the added value of the specific action. Importance also is given to encourage girls to pursue a scientist's career in the future in order to overcome the established stereotype of male primacy in science. At the same time, a new school culture is sought, in which pupils will strengthen their interest in the scientific way of thinking, and cultivate their physical curiosity about the world of particles in an accessible way, according to their age. During the last two years, Roma (Romani) students of our school have been given the opportunity to benefit from the advantages of the activities (in a context of inclusive education) and thus to be better integrated not only in our society but also to meet a new open window to science. On the website you will find all the activities that were developed the last three school years (2017-2019). For their originality we would highlight the cloud chamber (1927 & 1936 Nobel Prize in Physics) and the gravitational waves model. Both of them are accompanied by the corresponding digital storytelling videos (English subtitles). Mr. Rainer Weiss, the 2017 Nobel Prize laureate in Physics, sent us his best comments and feed-back about our gravitational waves model. We also highlight the Skype interview from CERN given by the assistant of Peter Higgs, the 2012 Nobel Prize laureate in Physics, Mr. Leonidopoulos, our online board game, our classroom digital planetarium and Rutherford's/Bohr's model of the atom animation, depicting Lithium, which was captured using a drone.

Categoria del progetto/Project category : Educazione fino a 10 anni/Up to 10 years

Link al video di presentazione/Link to the presentation video:

<https://www.youtube.com/watch?v=49iJMIPft-U>

<http://users.sch.gr/papandre/cern/>

In che modo il progetto usa le tecnologie in modo innovativo/Use of technologies ...:

Modern technologies help our students to share, disseminate and communicate the results of their work and their experience with other peers in the local area and of course the rest of the world. In this framework, the website as well as the Youtube channel act as an online library with useful ideas for future projects.

Moreover, the electronic stuff is available to facilitate classroom research and activities, not only as a good visual material but also as a teaching guide or tutorial. Of course, there are also applications such as PhET

simulations, embedded in our website, that assist students to test different experiment parameters or build their own model with safety or to carry out an activity that otherwise would not be possible to be done, for example examining the structure of an atom. Finally, the digital storytelling videos allow our students to express their feelings and thoughts about science artistically, giving motion and sound to their drawings. Priority is given to the design and the development of classroom experiments (Hands on Experiments), according to Bruner & Vygotsky's pedagogical principles. Then, technologies help and facilitate information retrieval, research, visualization and, of course, the dissemination of the results as described above. Thus, there is a clear balance between the pedagogical method and modern technologies.

Indicare gli elementi di innovazione del progetto:/ What are the technological aspects of the project?:

Our goal is to pass on to the children the message that the occupation of scientists with science is not something abstract or something that lies only in the sphere of theory or scientific fantasy. On the contrary, it has applications in practice and especially in the field of medicine for the benefit of people and our society in general. An example is the Positron tomography (P.E.T.). And this is a great chance to become familiar with big ideas and the latest discoveries in particle physics mainly through hands-on experimentation, during school age. In the case of the Cloud Chamber, the idea of a cloud traveling in a chamber, like clouds do in the sky, is symbolic. It symbolizes the journey of knowledge and experience that our students will acquire and spread to their colleagues, from their involvement with an experiment that in 1927 and 1936 gave Nobel Physics and shed more light on the cosmic rays that "showers" our planet. Our experimental layout is already tested and ready to visit our schools, sharing new knowledge and new experience for science. The same sense is expressed through our other model of gravitational waves. These STEM and STEAM (Science, Technology, Engineering, Arts, Mathematics) activities enhance students' understanding of how science works, allowing them to experience science in a fun and less daunting way. They will also learn by doing and deal with their "mistakes" as a part of the authentic learning process. Moreover, they will develop problem-solving strategies in order to generate alternative ideas of approaching and completing learning tasks, through hands-on experimentation. Finally, they will unfold their creative power by been encouraged to use their imagination, their language skills and sensory abilities such as storytelling, gaming, model making and theatrical acting.

Quali sono gli aspetti tecnologici del progetto?/What are the technological aspects of the project?:

The following software applications were used: WordPress, to build an efficient, functional and manageable website. YouTube, to create our channel for our videos and animations. An old version of Macromedia Flash (8) and the Hot Potatoes 6.0, to construct our board game. PhET - University of Colorado Boulder, to assist our students understand difficult principles of Physics, to construct models, to check variants and of course play, helping one another. Windows Movie Maker, to express and animate their ideas on Science (especially their project on Cloud Chamber and Gravitational Waves). Audacity, the free open source audio software to record, mix and convert sounds. Star Walk 2.0 mobile and tablet app for our classroom small digital planetarium.

Con quanti utenti interagisce il progetto?/How many users does the project interact with? :

The first school year (2017-2018) of the implementation of our program 163 pupils participated in the activities. 2nd Primary School of Pírgos, Peloponnese, Ilia (68 pupils). 7th Primary School of Pírgos, Peloponnese, Ilia (43 pupils). Primary School of Ancient Olympia, Peloponnese, Ilia (24 pupils). Giannitsochori Primary School, Peloponnese, Ilia (14 pupils). Vytina Primary School, Peloponnese, Arcadia (14 pupils). The second school year (2018-2019) Epitalion Primary School, Peloponnese, Ilia (24 pupils, including 8 Romani pupils). Current school year (2019-2020) Epitalion Primary School, Peloponnese, Ilia (23 pupils, including 4 Romani pupils).

Di quali mezzi o canali si avvale il progetto?/Which media or channels does the project use?:

We also refreshed our YouTube channel and 34 new videos were uploaded. Two interviews were given (18 October 2017 & 17 May 2018) at the local T.V. channel (O.R.T.) of our town, regarding the dissemination and the results of our project and two local newspapers covered two separate learning events (31 March 2018 & 21 May 2018). Please, visit the news page on our website (http://users.sch.gr/papandre/cern/?page_id=10)



Il progetto è già stato replicato? /Has the project already been replicated? :

At an informal level, that is, outside school framework, two workshops for children were organized. The subject was about gravity's nature. The first took place at the central public library of Pírgos (June 2018) and the second at Patras Science Festival (May 2019, 100 Km from Pírgos), at the Hellenic Open University (<https://www.patras-science-festival.gr/en/>). Two lectures organized by the school counselor of our region (November and December 2017) were also given to primary school teachers on ideas for teaching particle physics, using simple materials. Please, visit the news page on our website (http://users.sch.gr/papandre/cern/?page_id=10)

Quali sono le aspettative future?/What are future expectations?:

A main fact for the initiative to support this educational project is the absence of space, cosmology and particle physics teaching in Primary School. 2006 was the latest year that something similar was taught in the official curriculum, while science is evolving and daily presents new data to society. Especially, NASA-ESA, CERN, LIGO and VIRGO make up-to-date announcements about the creation of matter as well as the role, the nature and the correlation of forces in our Universe. These are issues that not only excite adults'

but also children's imagination. And this is a great chance to become familiar with big ideas and the latest discoveries in Science, mainly through hands-on experimentation, during school age. So, our expectations for the future of the project are to continue supporting this effort, taking small and steady steps and developing new up-to-date educational material, according to the interests and the potential of the primary school children, especially those who need encouragement and inclusion.

Allegati/Attachments:  [Links to our project resources](#) ^[1]
 [Our classroom small digital planetarium](#) ^[2]

Durata progetto/project duration:

From September 2017 until the current school year (2019-2020)

Tipologia dell'ente/Kind of organization:

Primary School

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Collegamenti

[1] https://gjc.it/system/files/progetti/allegati/links_to_our_resources.pdf

[2] https://gjc.it/system/files/progetti/allegati/our_classroom_small_digital_planetarium_0.pdf