



# Project Challenges

## *TF2: Children & Schools*

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2013

### Ancient Greece

The greatest challenge was to get the students to present their work to other students and the rest of the local community. This proved only partially successful since the participating students did make their presentations to other students in our school and other high schools, but did not present the project themselves publicly in front of the rest of the community in the astronomy day in the summer festivities. This was finally presented to the public by the coordinator of the project with the students being among the audience.

A restriction of this project is that it dealt with only a very small part of astronomy and the participating students were only partly exposed to the astronomical knowledge. A more systematic approach, with a regular astronomy course and hands-on activities with the telescope both at class hours and at evening sessions would greatly enhance the students' acquired knowledge and their abilities to carry out observations. There are plans to connect the school computer laboratory with the telescope so that it can be placed at the roof of the building and people from inside the school can remotely access it and observe sky objects without climbing on the roof of the school at night (only positioning of the telescope is currently supported with remote operation of camera and CCD but without any remote focus support). Furthermore, if the above approach is applied to high school students, who are not as heavily burdened with classes as Lyceum students, and can work on astronomy for 4-5 years before leaving school to enter university, stable groups of students can be formed which can act as bright active nuclei attracting others to the group. Unfortunately the students who participated in this project were already in the second grade of Lyceum during the school year 2012 -2013 and this school year (2013-14) are very busy preparing themselves for the pan-Hellenic exams for entering the university. For this reason, students from the first grade of our school also participated in astrophotography, in the last part of the project in the fall term.

### Astronomy for the Visually Impaired

Raising the 5,500 euro that were needed on top of OAD's grant has proven to be difficult and time consuming. Production was delayed because we had to reach a minimum of 10,000 euro before starting. We had anticipated more financial cooperation from some of the supporting institutions, but that was not possible in the end.

Shipment has also been delayed because of the lack of funding. This also made us choose different shipment strategies, mainly using a courier service in a few cases when the parcels had to arrive in a short time, and the national mail systems when

there was no urgent delivery required. Payment upon parcel arrival was not possible with any of the shipping companies we contacted.

We also had to cover some quite high custom taxes in India for two boxes, which meant in the end that we could send a smaller number of kits within the available budget. A third kit sent to India using the public mail service made its way through customs without paying for any taxes. Therefore, we are now giving priority to shipments through the national mail companies instead of using a courier company (MRW and FedEx).

### **Mathare-Kenya Ambassadors of Astronomy**

High taxes on imported galileoscopes to Kenya were the biggest challenge faced during the project implementation. Despite of numerous efforts to get the tax exemption from the Ministry of Education, the process took too long and was unsuccessful. We manage to cover unexpected payments through the project funds at the expense of the project leader's flight ticket to Kenya. The ticket was covered by the funding from Polish development assistance program – Polish Aid.

2014

### **Conduction of Astro Activities Nepal**

Students of class 8, 9 and 10 are included in the activity though other lower grade students are also wanted to participate. In the project only four schools are included but there are many demands from other schools to participate in such program. Only government owned schools are included in the project which lack educational resources due to which use of multimedia became challenging.

Nepali language is the main language for teaching in all the public schools selected. They used Nepali language books in science hence astronomical terminologies are quiet harder for the students though the resource book [Bramhanda ra Sauramandal (Universe and Galaxy) written in Nepali language by Moti Kaji Sthapit as a reference book of basic astronomy] helped to explain in details.

### **Taking Astronomy to the Portuguese Countries**

1. ***Provide a legacy of sustainability for the project:*** The major goal established for the project was to provide sustainability for the project in years to come and not only for the duration of the project itself (see page 5). This has translated in many

successes but also added delays in the immediate implementation of the training and most of the times prevent it to occur in the timeline predicted.

2. ***Find the best and most active partners on the field:*** When the project started it had already established a solid baseline of partners, mostly achieved by the still ongoing efforts from Galileo Teacher Training Program back in 2009 during International Year of Astronomy as a cornerstone project. As time progresses there is the paramount need to understand and carefully meet the new realities of the network involved. Although most of the Local Points of Contact are still very active in the field of outreach and education, there was (and still is) the need to establish new connections as many other partners were identified as active future points of contact during 2014.
3. ***Meet the local needs for the different communities and different realities for each country:*** From the many free online and low cost resources identified prior to the submission of the project, we were aware of the need to focus our efforts in order to adjust and link the local communities to them in order to achieve a true long lasting impact and usefulness in each country and community.

From the research and discussion conducted between all parties involved, a set of activities and resources were selected and compiled into a single activity booklet in Portuguese (please see page 6), starting in December 2013. Gathering additional efforts and different collaborating entities, such as Matemática do Planeta Terra (Mathematics of Planet Earth - UNESCO Portugal) the final result of this cooperation was completed during November, 2014.

Also, as new and active local points of contact were established during the implementation stage of the project, there was the need to redefine some of the planned etrainings. An example of one of these cases is Cape Verde and the need to have sessions focusing on Universe in a Box Kit.

4. ***Provide a long standing support and raising awareness of global partners:*** As the implementation stage continued and the awareness of the project also spread in each country, the need to forge long term protocols has risen. Determined on providing a more focused and long term plan of support working group, NUCLIO/GTTP has teamed up with AI-Lisbon (Astronomical Institute - Lisbon) and submitted a proposal to IAU – OAD for the creation of a Portuguese Language Expertise Centre for Astronomy.
5. ***Understand the political and social realities of each country and community:*** Some of the communications faced an extended degree of delay due to local

constraints in the community or country, such is the case of Guinea Bissau riots, losing momentum for implementing the project in accordance to the timeline established. Another case such as Macau, the internal bureaucracy faced in validating the credentials for the etraining.

2015

### Astro Science Ambassadors Tanzania

Description	Impact	Actions Taken
Insufficient computer literacy on the use of computer as learning, teaching and communication tool.	Slow adoption of the new teaching skills, and inaccessibility of appropriate information.	Computer literacy, use of internet and communication tools was introduced in training workshops.
Bureaucratic processes among involved organization.	Interfere smooth flow of communication, timely delivery of reports and carry out of activities.	Introduced regional project coordinator as focal person to assist quick flow of information.
Slow adoption to new way of learning and teaching	Slow realization of the impact of astronomy on teaching and learning of science.	Twisted project focus to astro-science areas directly linked to Tanzania education system, curriculum, syllabuses and teaching guidelines.
Conflicting schedules between ambassadors, school visits and host teachers.	Delayed carry out of activities.	Emphasized on better planning and better communication among stakeholders assisted by project coordinators.
Inability to conduct night sky viewing	Failure to comprehend night sky observation experience.	Encouraged the use of online resources like Stellarium and projector to display night sky.
Limited time provided by some host schools	Stressed astro-science ambassadors on delivering their lesson plans.	Encouraged early communication with host schools and proper lesson planning based on agreed time.
Weather challenge and bad roads made some schools inaccessible during rainy season.	Failure to deliver lesson plans in time.	Advice was given to avoid school visits to schools with poor roads, during rainy season.

### Astronomy Outreach for Inner City Youth

Finding suitable funding sources to provide [teachers] with Galileoscope kits will continue to be a challenge, and a limiting factor in the ability of teachers to do this kind of hands-on activity with their students.

## Discover the Universe

1. **Reaching the Target Audience:** Despite our efforts to reach teachers in developing countries, especially in West Africa, it proved very difficult to recruit them. Some people mentioned how the lack of good internet connection made the workshop less attractive to them. We knew this would be a challenge but it turned out worse than we had anticipated. This situation affected the geographic distribution of the participants: only 15% of all participants came from Africa (see Figure 1) while 80% came from Canada and France alone. Surprisingly, many Canadian teachers decided to register to the international workshop even though we had a Canadian version coming soon. In total, we had 27 participants from 5 different African countries (6 if we include Reunion Island). This is disappointing for an online workshop but would be great for an in-person workshop. Also, these 27 people might not have had the chance to attend a workshop if it had not been online. So overall, we didn't reach as many teachers in developing countries as we had hoped.
  
2. **Active Participation During the Workshop:** In an online workshop, it is always difficult to know how active a group of participants will be: Will they ask us many questions? Will they comment online (YouTube, Facebook) and interact with one another? Our experience shows that it varies a lot from group to group. Unfortunately, this particular group proved to be very quiet. They didn't ask many questions and there was very little interaction online. However some participants were very dedicated and asked many excellent questions by email.

Also, as in most free online courses, many participants drop out. Out of the 176 registered participants, 75 of them filled the form to receive the certificate of completion. This gives us a completion rate of 43% which might seem low, but is still much higher than the 10% most MOOCs (Massive Open Online Courses) get.

## How Big is Earth

We were only able to collect fragmentary data from four schools because teachers who said, "Yes, they would participate in the project," did not realize that it was a "real learning project" that lasted two months. The students from Morocco, Sweden, and USA took measurements on cloudy days. Out of 68 enrolled students, only 10 students finished the project and that was because I really nagged the teacher to complete it.

I discovered that there are lots of Eratosthenes projects online. Most of them are designed to collect angles and lengths and compare measurements. Ideas for teachers to use are posted in these projects but they are not set up for student discussion of ideas and sharing.

The lack of basic knowledge by so many of our middle school participants makes analysis of the Project problematic. The final survey contained the data for the two students who responded to the post activity survey. Although there is one wrong answer for the circumference of the earth, without knowing what these students responded in the pre activity survey does not allow us to determine if, even on a small scale, doing the project had an impact on students' content knowledge and science understanding.