



A study on the use of a metadata schema for characterizing school education STEM lessons plans by STEM teachers

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Go-Lab

Global Online Science Labs for Inquiry Learning at School

Collaborative Project in European Union's Seventh Framework Programme

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The Go-Lab Consortium

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Executive Summary

Implementation Phase-A covered the period from project month 16 to month 21, which corresponds to 1 Feb 2014 – 31 Jul 2014. During that 6-month period partners organized and conducted 35 implementation activities around the host countries. Of which, 17 were activities with students (with 560 participants) and 18 training of teachers (with 380 participants). In total 381 secondary schools were involved in these activities (344 schools in teacher trainings and 37 in in-classroom activities with students). The full list of activity reports is included in the document.

The partners' focus for Phase-A was primary on offering and conducting comprehensive training for teachers covering the pedagogical and technical aspects of the Go-Lab approach. In this way they laid the foundations for successful next larger scale implementation phases with newer releases of the system (with updated and enriched repository of labs and authoring environment). The numbers reported herein are well exceeding the target set in Description of Work, i.e. implementation in 100 schools, and were necessary to be accommodated in order to satisfy the overwhelming interest and demand by schools to participate in the project. In Phase-A, and in the majority of the reported events, activities involved the use of online labs standalone. In some cases there were implementations of existing or already developed Inquiry Learning Spaces with minimum authoring by teachers. The online labs that partners demonstrated and introduced to schools were from all three categories, simulations/virtual labs, datasets and remote labs. The activities were linked to various science curriculum domains and in particular to Physics, Astronomy, Technology, Biology, Ecology, Maths, and Chemistry. The grand majority is on Physics and Astronomy, a fact explained by the expertise and experience of the partners involved, and the online labs available in the repository at the time. The national coordinators and partners that organised or conducted these activities and closely interacted with the teachers and schools identified certain areas of concern or expectations of improvement that they expressed/recommended to be taken into account for the next implementation phase. The next implementation Phase-B runs in the 9-month period from month 25, 1 Nov 2014 – 31 Jul 2014. During this phase the pilot schools will use the system more extensively and at 3 levels, namely, use the Go-Lab repository of labs for searching; implement existing Inquiry Learning Spaces developed by the project teams; develop new or adapt existing Inquiry Learning Spaces.

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1 Introduction

Europe needs its youth to be skilful in and enthusiastic for science and also regard it as potential future career field in order to guarantee innovation, competitiveness and prosperity. To ensure this, large scale initiatives are needed that engage students in interesting and motivating science experiences. To achieve this, the Go-Lab project's approach is to offer to teachers and their students a well organised federation of remote laboratories, virtual experiments, and data-sets (all together referred to as "online labs") along with supporting, easy to access, lightweight end-user interfaces and frameworks that facilitate the use and adoption of them in the classroom practice and create an out of the ordinary engaging educational experience. Furthermore, teachers will be supported and guided to develop, implement and share their educational scenarios and build a wider community of practitioners that promotes the best practices across Europe and beyond.

The goal of the project is to implement the aforementioned approach at large scale in Europe, namely at 1000 schools, in 3 pilot phases, in the 15 participating countries of the consortium (the Netherlands, Greece, Bulgaria, Romania, Belgium, Poland, Italy, Cyprus, Germany, Spain, Austria, Estonia, Switzerland, UK, and Portugal).

The document herein first describes the main elements of the implementation plan that give the methodological and practical guidelines of actions to partners to be followed in order to realize this goal in the course of the project. Then it focuses on the implementation activities reported for the Phase-A, which covers the six-month period from 1 Feb 2014 to 31 Jul 2014. It concludes with the summary of results.

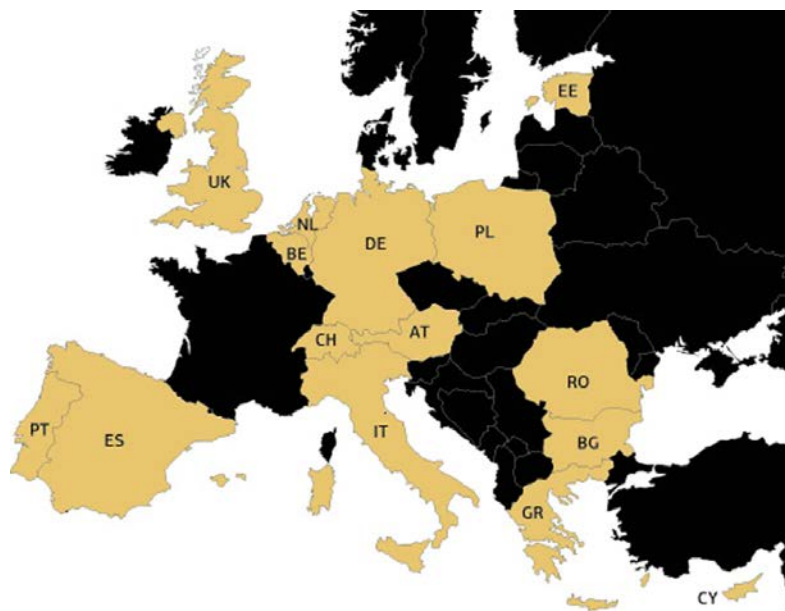


Figure 1. The 15 European countries where the Go-Lab project will be implemented

2 Objectives

The aim of the Work Package 7 is to implement the Go-Lab pedagogical approach and the related inquiry classroom scenarios, developed in Work Package 1, at large scale in Europe. The project will be implemented in 3 phases at 1000 schools in the 15 participating countries, the Netherlands, Greece, Bulgaria, Romania, Belgium, Poland, Italy, Cyprus, Germany, Spain, Austria, Estonia, Switzerland, UK, and Portugal. This is a challenging task that can only be realized with a well-planned, coordinated and collaborative effort along clear and systematic guidelines detailed in an implementation plan. The Implementation Plan developed for this task is laid out in the coming sections and documents the following set of objectives which are organized in four interconnected major elements:

- [Implementation activities]
To describe and propose a methodology for the involvement of the pilot schools in the Go-Lab project. General guidelines and practical examples of implementation activities to illustrate the process of recruiting, building, supporting and sustaining a community of teachers are given.
- [Key partner/coordinator per country]
To define the role and the duties of the National Coordinators underlining their importance in the collaborative effort needed to manage the implementation activity.
- [Number of schools per country per implementation phase]
To distribute the number of the pilot sites in a balanced way across the 15 participating countries.
- [Reporting of activities]
To describe the reporting procedure that should be followed in order to document and monitor the implementation progress throughout the life of the project.

The scope of these objectives or procedures may not change over the lifetime of the project, however additional and complementary items (e.g. contingency plan) might be added if necessary reflecting the experience gained as the project advances.

3 Implementation activities

The implementation of the Go-Lab project takes place in 3 phases covering 3 consecutive school years (see Fig.2). The pilot schools are recruited from countries where partners are based (the Netherlands, Greece, Belgium, Cyprus, Germany, Spain, Austria, Estonia, Switzerland, UK, and Portugal) and also from Bulgaria, Romania, Poland and Italy. In Phase-A more than 100 pilot schools were recruited [6]. In Phase-B 400 more schools will be added in the network of pilot sites [7]. In Phase-C 500 more schools from the participating countries will join the network. Phase-A starts in M16 (Feb.2014) and lasts 6 months, Phase-B starts in M25 (Nov.2014) and lasts 9 months and Phase-C starts in M37 (Nov.2015) and lasts 9 months. Before and during each phase various in-school implementation and community building/support activities are planned to take place in each country organised by the partners of the consortium in order to attract and engage science teachers in the Go-Lab project. (The community building actions are the focus of Work Package 6, further details can be found in reference [3] Go-Lab Deliverable 6.1 “Specifications of Participatory Activities”).

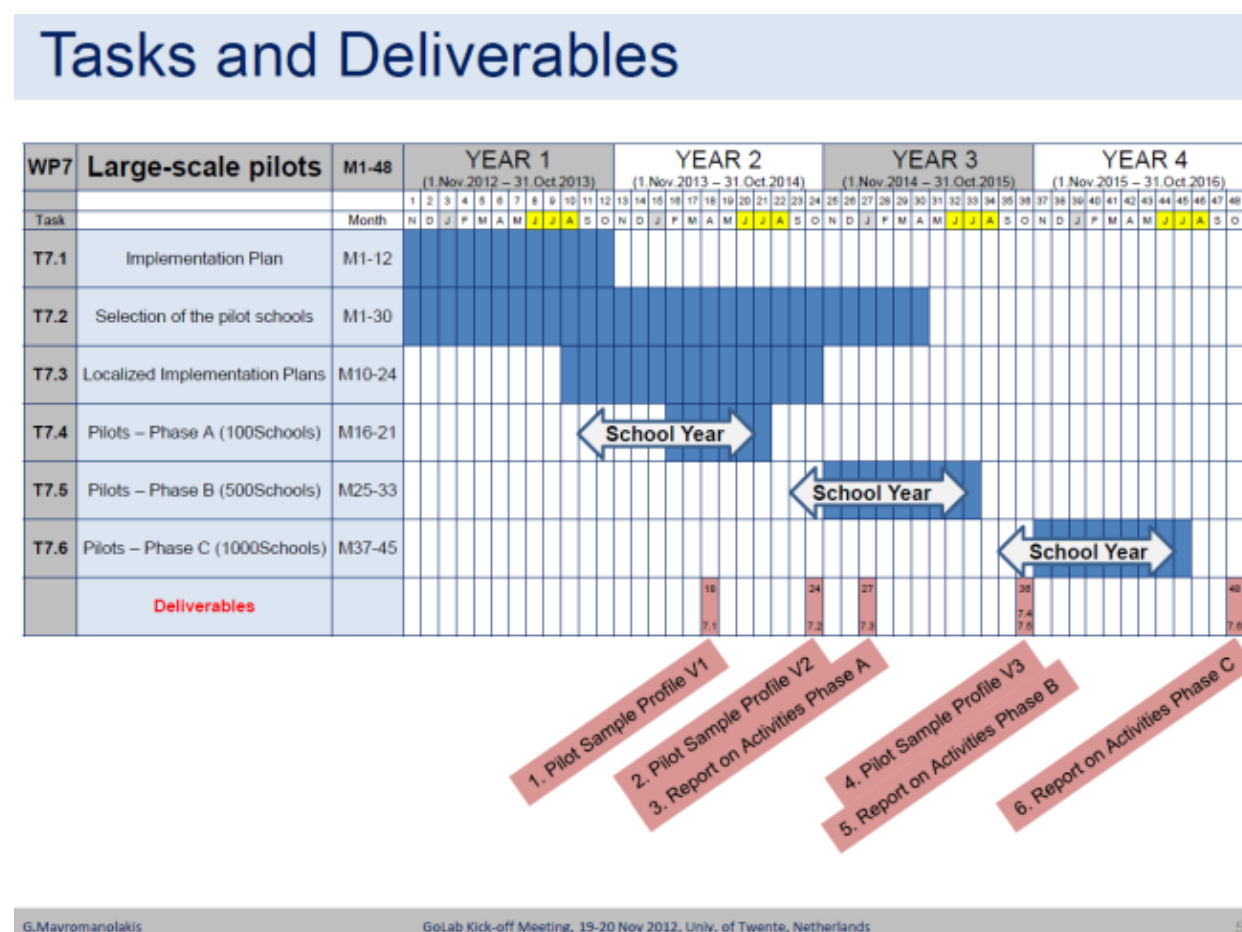


Figure 2. Time plan of tasks and deliverables of Work Package 7 – “Large-scale pilots”

In general, an implementation activity intends to bring into the classroom practice the use of online labs and related resources in an innovative, user friendly and engaging way so that both teachers and students have a stimulating experience in science education. Series of support activities (such as presentation seminars and training workshops) are organised for teachers, in

order to get familiarized with the relevant technology, gain confidence and be able to adopt and also adapt the use of online labs in their everyday school practice.

All in-school activities with students and preparation/support actions such as training for teachers, both referred in the following as implementation activities, events or actions, are centrally coordinated by the Work Package 7 Leader, but also managed locally by one partner in each of the pilot countries who acts as the National Coordinator and is responsible for the local management and localization of the project resources and activities. The role and duties of the National Coordinators are discussed further and in detail in section 4. At this point it should be noted that the Go-Lab consortium is composed of partners with diverse background and there are countries that are represented by a partner or partners with limited or no experience in education. In the spirit of a collaborative and shared effort those partners are given every feasible support and guidance by more experienced partners.

Of particular concern is how and from where science teachers can be approached initially and then be engaged in implementing Go-Lab activities in their schools. This concern was expressed vividly by both more and less experienced partners during consortium and online meetings illustrating the challenge that the project faces in reaching 1000 schools across 15 countries. With respect to methods of approach recommended, these were briefly presented during the meeting, see reference [2]. They are further elaborated below.

Methods of approach

▪ Top-down

In this approach partners use official channels of communication to approach and invite teachers/schools to Go-Lab's activities (introductory seminars, training workshops etc). In other words, the National Coordinator or local partner in charge contacts the district's school counsellor or regional bureau of education or other equivalent authority and informs them about the Go-Lab project. An introductory-informational event is arranged and teachers from the area are invited officially to attend. An example agenda of such an event is shown in Appendix. The teachers interested further in applying Go-Lab in their science classroom are given further guidance and support material with educational content (i.e. classroom scenarios using online labs) to start with. If needed additional events to provide training and practicing are organised (see example agendas for a short or a day long workshop in Appendix).

▪ Bottom-up

Partners organize informational events and visionary workshops, as indicated in Deliverable 6.1 "Specifications of Participatory Activities", inviting science teachers from schools in their local area. In addition several Go-Lab partners have collaborated within the framework of European projects on education with pioneering and innovative science teachers. In this case partners approach directly these already known teachers, and possibly through them their network of colleagues, informing them about Go-Lab.

Also within this approach the National Coordinator or partner in each country contacts science teacher societies and national professional unions, participates in their conferences or annual meetings by giving a talk or seminar or arranging workshops to be held during these events to inform and attract teachers in Go-Lab.

Partners that are being or operating within institutions of higher education can approach faculty members in the Dept. of Education in their own or local university who are involved in research on science education. Through them can be approached teachers and schools with whom they are currently conducting field research or have collaborated in the past.

▪ **Educational contests for teachers and students**

Partners organise in collaboration with educational authorities or science related societies/centers/museums contests, at regional or national or even international level, that promote the use of online labs in the classroom. An example of such a contest could be on the development of educational scenarios or activities using online labs along a general science theme or a more specific one (e.g. in connection with celebrations of a key event such as a scientific discovery or the birth of a renowned scientist). The teacher who designs and implements the best activity will be awarded a prize, e.g. funding support to participate in a conference or summer school for professional development. These contests will be organised and implemented during the school years in line with the pilot Phases A, B and C. It is suggested that at least one contest per country per implementation year will be held.

These methods have been followed in the past successfully by Go-Lab partners in various countries. However they may not prove efficient and adequate in certain countries or regions. Country specific implementation plans have been developed in collaboration with the National Coordinators to reflect local circumstances and practices. They have been documented in the internal deliverable G7.2 “Localized Implementation Plans” due in M12.

Further potential points of interaction with science teachers are also listed below. These are the established educational programmes run by Go-Lab partners and are attracting science teachers at international level. Introductory seminars and training workshops on Go-Lab approach and platform can be integrated within the framework of these programmes. Participant teachers from the various countries who express interest in Go-Lab will then be delegated to the corresponding National Coordinator for further guidance, support and inclusion in the community of practice in their country. In this way a crucial obstacle of implementation being the language and cultural barriers across the different countries will be overcome.

Points of interaction – Established educational programmes

CERN High School Teachers Programme

(<http://teachers.web.cern.ch/teachers/>)

The programme consists of a 3-week stage, taking place every year since 1998 at CERN during the month of July. The stage is open to Physics High School Teachers from all CERN member and observer States, as well as from other countries subject to funding availability.

(CERN is a partner of Go-Lab)

The European Space Education Resource Office (ESERO)

(http://www.esa.int/Education/Teachers_Corner/European_Space_Education_Resource_Office)

The European Space Education Resource Office (ESERO) project is ESA's primary way of supporting the educational community. Established in various Member States, each ESERO aims to support the specific educational needs of the Member State and their Education Community. Teachers are able to access specially developed materials that are tailored to their needs and to attend dedicated training workshops. Lesson plans, fact sheets and comprehensive education kits are also available online. The ESERO project aims to enhance young people's literacy in STEM subjects and associated applications. It uses space related themes and the genuine fascination for spaceflight, to encourage pupils to consider careers in these fields and in the space domain in particular. Each ESERO implements an annual series of primary & secondary teacher training sessions. These are usually in collaboration with national

partners already active in STEM education. They use and disseminate existing ESA/ESERO education materials and, if appropriate, develop specific resources tailored to the needs of their national education community. ESEROs also organise national ESERO teacher conferences for secondary and primary education. (ESEROs are located in these Go-Lab countries: the Netherlands, Belgium, UK).

(ESA is a partner of Go-Lab)

Annual ESA Summer Teacher Workshop

(http://www.esa.int/Education/Teachers_Corner/Annual_ESA_Summer_Teacher_Workshop)

Every summer, ESA's Education Office welcomes around 40 teachers from across Europe to ESA's European Space Research and Technology Centre in the Netherlands. Over the course of four days, in the heart of ESA's largest establishment, the teachers engage in a number of workshops about how space can be used as a context for teaching many subjects. Space experts, both from within ESA and outside, guide the teachers through mainly hands-on practical workshop sessions. The workshops are fully sponsored and applications are welcomed from all ESA Member States.

(ESA is a partner of Go-Lab)

Galileo Teacher Training Programme (GTTP)

(<http://www.galileoteachers.org>)

Initiated during 2009's International Year of Astronomy, and named after the famous 17th century Italian astronomer and physicist, the GTTP now continues to train teachers across Europe. The emphasis is placed upon introducing science teachers to the resources that can be used to teach astronomy and astrophysics. The programme aims to help teachers inspire young people to consider science careers. Workshops take place at various sites throughout Europe. NUCLIO has long experience in organizing GTTP supported events.

(NUCLIO is a partner of Go-Lab)

**COMENIUS and GRUNDTVIG in-service training for school and adult educators
(now followed up by Erasmus+ Programme)**

The Lifelong Learning Programme for European co-operation in the field of education and training offers grants to teachers and teacher educators to participate in training courses, seminars and conferences held in Europe and help them upgrade their professional skills in the field of education. Partners of the Go-Lab consortium (e.g. EA, EUN, NUCLIO) have long experience in organising international schools and workshops on professional development of science teachers and educators. EA already took the initiative to organise the first Go-Lab related International Summer School to be held in Greece in summer 2013 with its participants supported by the Comenius grant scheme. It is envisaged to be a great opportunity of showcasing the project's approach and framework to teachers from various countries. It is further proposed that similar summer schools to be held in 2014, 2015 and 2016 after the end of the pilot phases A, B and C respectively. These events will follow the project's progress, get together less and more experienced teachers who can develop and share best practices and reflect on their experience and concerns.

(EA and EUN are partners of Go-Lab)

Additionally, as already mentioned the implementation effort is supported through effective community building and support of the implementation communities in each country by the work performed in Work Package 6 (for guidelines, description and schedule of visionary and practice reflection workshops to be organised in each country see Deliverable 6.1, ref.[3] and [4]). The

figure below depicts the mechanism of recruiting and engaging teachers in Go-Lab and the interconnection between Work Packages 6 and 7.

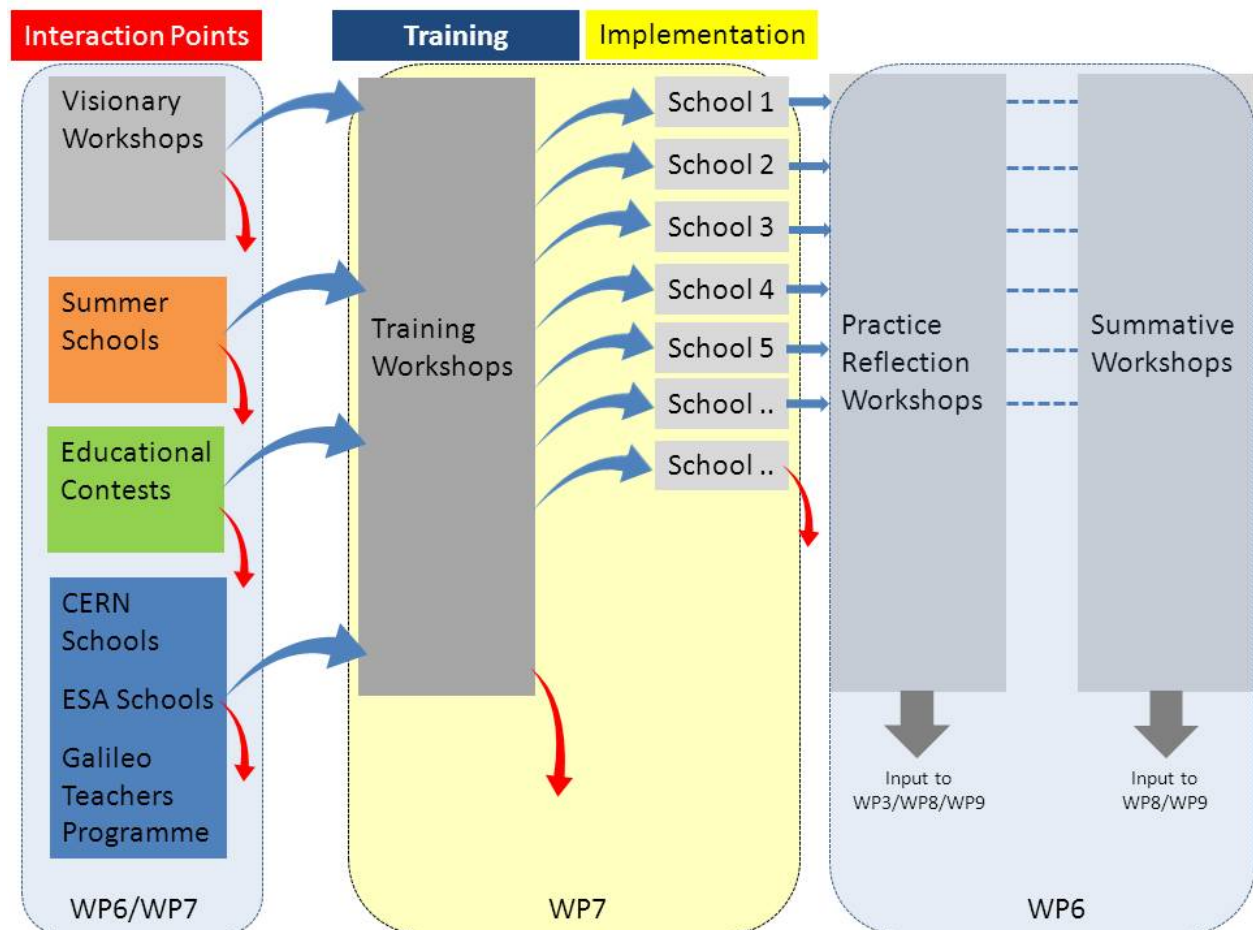


Figure 3. Mechanism of recruiting, engaging and sustaining a community of practitioner teachers in Go-Lab

The success of the implementation is strongly depending not only on following the guidelines laid out in this implementation plan but also on the outcome of tasks in other work packages that should be delivered on time and characterized by sufficient quality and functionality. In brief a successful implementation requires having at hand during the course of the project to offer teachers an overall educational approach and functional environment characterized by the following qualities:

- it satisfies users' real educational and pedagogical needs,
- it is attractive,
- it is user friendly,
- it is easily available and properly supported.

4 The role of National Coordinators

All implementation activities are centrally coordinated by the Work Package 7 Leader, but also managed locally by one partner in each of the pilot countries who acts as the National Coordinator. The National Coordinator is responsible for the local management and localization of the project resources and activities regarding the selection and evaluation of the pilot sites, the implementation activities and supporting actions. Initially the planning and coordination of each implementation activity will be performed and supported centrally (by the partners who have extensive experience in the field like EA and EUN) but during the implementation phases the activity will also be managed locally by the National Coordinator in each of the pilot countries who will act as the key national contact and who will be responsible for the local organization and localization of the project's implementation plan. In this context the role of the National Coordinators is considered as one of the key factors for the successful implementation of the Go-Lab's pedagogical approach in their country and for driving change in the school communities by first diagnosing and understanding the context and players and then trying to "convince" them. The pilot schools in each participating country will serve as working models and demonstrators, where the project's activities will be realized.

A series of support activities (such as presentation seminars and training workshops) are organised, in order for the users to get familiarized with the relevant technology and to enable the adaptation of the use of the online labs in the everyday school practice. In the framework of the workshops the users will be informed about the project's approach, as their participation to the project will be systematically monitored and assessed. Follow-up workshops, so-called practice reflection workshops, will be organised by the National Coordinators for each of the participating countries, according to a common generic procedure developed within the Work Package 6, which however will allow for flexibility to adapt to a variety of local circumstances.

The selection of the first group of schools started in the second half of the first project year, based on National Coordinators' accumulating experiences from the interaction with the school communities and taking into account any expressed school interest provoked by local project publicity and dissemination actions. In the whole duration of the project, 1000 schools in total will participate as pilot sites in the project's activities, distributed in a balanced way across the participating countries and the different school contexts. The National Coordinators are responsible for the selection of the pilot sites in their countries taking into consideration the local conditions while they will also follow a common set of selection criteria.

All evaluation activities will also be centrally designed and coordinated, but implemented in close collaboration with the National Coordinators responsible for each country's pilot sites. If necessary, after the selection of each pilot site and before its involvement in evaluated implementation activities, baseline data and information about it will be collected by the National Coordinators. This will produce a consistent set of 'known parameters' about the pilot sites, which will form the reference basis for all future analysis and comparisons.

The list of National Coordinators, as agreed and documented in the "Description of Work", is presented in the following table (see also reference [1]). It contains the code names of the institutions that will resume the role and the name of the person in charge.

Country	National Coordinator	
Netherlands	UT	Henny Leemkuil
Cyprus	UCY	Zacharias Zacharia
Germany	UDE	Adam Giemza
Spain	UD	Olga Dziabenko
Austria	CUAS	Amir Mujkanovic
Estonia	UTE	Urmias Heinaste
Switzerland	CERN	Angelos Alexopoulos
UK	UOG	Fraser Lewis
Portugal	NUCLIO	Rosa Doran
Greece Bulgaria Romania	EA	Georgios Mavromanolakis
Belgium Poland Italy	EUN	Evita Tasiopoulou

Table 1. The National Coordinators for the Implementation and Validation Activities

5 Distribution of pilot schools

The implementation of the Go-Lab project will take place in 3 phases covering 3 consecutive school years. In Phase-A at least 100 pilot schools have to be recruited from the 15 participating countries. In Phase-B 400 more schools will be included in the network of pilot sites. In Phase-C 500 more schools will join the network.

An algorithm has been developed to distribute the total number of pilot schools in a balanced way across the countries participating in the Go-Lab project. It takes into account the following considerations:

- a minimum threshold number of 15 schools in each of the 11 countries should be recruited by the partners in order to have a representative sample for implementation and evaluation
- the number of pilot sites per country should scale with the partners' total person-month effort contribution in Work Packages 6 and 7
- 10% person-month effort allowance is taken into account for the partners that are leading Work Packages 6 and 7. The corresponding person-month effort will be attributed in the overall coordination of the implementation and community building and support actions
- to recruit pilot schools in the 4 countries (Bulgaria, Romania, Poland and Italy) that they are not represented by partners in the Go-Lab consortium a double person-month effort per recruited school is assumed

The outcome distribution accommodating these considerations is shown in table 2. For certain countries that are represented by partners that have an international status rather a national one e.g. EUN in Belgium, CERN in Switzerland, the number of schools quoted should be interpreted as target recruits coming from European countries in general and not only from the partner's host country.

The distribution shown in the table below was presented and discussed during the Go-Lab kick-off meeting and the "Communities Cluster" (see reference [2] and [4]). It is agreed to set the corresponding target numbers and is communicated regularly to the National Coordinators and the consortium at online and onsite meetings.

Country	Target Nof Schools	Pilots – Phase A	Pilots – Phase B	Pilots – Phase C
Netherlands	40	4	16	20
Cyprus	40	4	16	20
Germany	100	10	40	50
Spain	60	6	24	30
Austria	100	10	40	50
Estonia	40	4	16	20
Switzerland	70	7	28	35
UK	70	7	28	35
Portugal	100	10	40	50
Greece Bulgaria Romania	220	22	88	110
Belgium Poland Italy	160	16	64	80
total	1000	100	400	500

Table 2. Distribution of the pilot schools across the participating countries for the three implementation phases

6 Reporting of implementation activities

An integral part of the implementation plan is the reporting actions and procedures that should accompany the Go-Lab's three large-scale implementation phases across the 15 countries. Proper and up-to-date reporting is vital to monitor the project's implementation development, to have a smooth bookkeeping of activities per country, to determine overall progress and identify countries or regions where this may not be at satisfactory level, and to ensure the implementation quality. The reports form the basis of the project's official deliverables, to be submitted at the end of each implementation phase, as is the case with this deliverable D7.3 Report on Implementation Activities – Phase A due in M27, and similarly with D7.5 Report on Implementation Activities – Phase B due in M36 and D7.6 Report on Implementation Activities – Phase C due in M48.

According to the plan for each implementation event or series of activities the partner or partners involved is expected to produce a report. This should be sent to the National Coordinator or directly to the Work Package 7 Leader and uploaded to a repository/common user space in graasp. Reports document basic information about the activity such as date/period held, location, number of participants, target group and type of activity along with a brief and comprehensive description of the implementation activities, online labs used/demonstrated and learning outcomes reached or expected. Also, any material in printed or electronic format that is related to the implementation activity is also be attached to the report as well (e.g. dissemination material handed to participants, educational material produced specifically for the activity, photos or videos taken during the event, etc). The tables that follow show two forms/templates proposed and agreed for reporting Training Activities/Events with teachers and Implementation Activities with students respectively.

The implementation activity reports compose a key part of the overall public image of the project. Material included in them will also be used in dissemination actions and documents. Furthermore, the information contained in the reports will be assessed and integrated in the validation and evaluation work, which is the focus of the Work Package 8, in order to develop a concrete picture of the integration of Go-Lab in educational activities and identify the impact level in terms of the effectiveness and efficiency to the teacher communities.

The reporting of the implementation activities are periodically reviewed to measure progress and provide creative and constructive feedback to and from the National Coordinators and the partners involved in the organization and implementation of educational activities. The goals and scope of the reporting procedure will not change over the lifetime of the project, but specific improvements and revisions or complementary actions might be added over time if needed.

GO - LAB Event Code	<i>[LLXX-DDMMYY] Please follow this format: LL= 2 letter country code, XX = partner id, DDMMYY = date</i>
Title	
Country City/Region	
Working language	
Start/End Date	<i>Please use this format DD/MM/YYYY</i>
Organizing Institute	
Coordinator name and email	
Activity Form	<i>[Workshop, Seminar, Conference, Summer School, in-school activity, etc]</i>
Activity Type	<i>[Local, National, International]</i> <i>Local activities: Demonstration & training in schools or in teachers training centers, workshops/seminars at regional level, etc.</i> <i>National activities: National Conferences and Workshops, or Contests for students and teachers, etc.</i>
Total number of teachers/schools	<i>Provide the number, or an estimate, of participants.</i>
Implemented online labs	
Brief description	<i>Write one or two paragraphs describing in brief the activity (subject, objectives, target audience etc)</i>
Learning outcomes	<i>Give a short description of what participants are expected to have learned (e.g. will be able to use online labs and IBSE methods, be able to use online resources, repositories, tools, best practices etc)</i>
Website	<i>(if applicable) The URL of the website that has been set up for this activity.</i>
Photos or other relevant material	<i>Select 3-4 good-quality photos or other relevant material (flyer, brochure, poster) and attach them in this report</i>
Event agenda	<i>(if applicable) Please copy here the agenda of the event (program of activities, etc.).</i>

Table 3. Proposed template of Training Activity Report

G O - L A B Report Code	<i>[LLXX-DDMMYY] Please follow this format: LL= 2 letter country code, XX = partner id, DDMMYY = date</i>
Title	
Country City/Region	
Working language	
Start/End Date	<i>Please use this format DD/MM/YYYY</i>
Partners Involved	
Coordinator name and email	
School Profile	
Number and age of students	<i>Provide the number, or an estimate, of participant students. Please also indicate their age group</i>
Activity Description	<i>Write one or two paragraphs describing in brief the activity (mention subject e.g. physics, biology, etc, objectives, target audience etc)</i>
Implemented online labs	
Learning outcomes	<i>Give a short description of what participants are expected to have learned in connection with the concepts of Big Ideas</i>
Photos or other relevant material	<i>Select 3-4 good-quality photos or other relevant material (brochure, poster) and attach them in this report</i>

Table 4. Proposed template of Implementation Activity Report

7 Reports for implementation phase-A

7.1 *Austria*

CUAS conducted and coordinated the implementation activities in Austria listed in the following table. Two training activities for science teachers were organized, with 22 participants, where the Radioactivity and VISIR labs were introduced and practiced. In one occasion there was also a workshop for high-school students with 52 participants using the labs and related ILSs. The subject domains of these activities and labs focused on physics and technology.

Date(s)	Type	Participants	Labs	Subject(s)
03/04/2014	Training of teachers	16 (10)	Radioactivity, VISIR	Physics, Technology
03/04/2014	Activity with students	52 (4)	Radioactivity, VISIR	Physics, Technology
07/07/2014	Training of teachers	6 (6)	Radioactivity	Physics

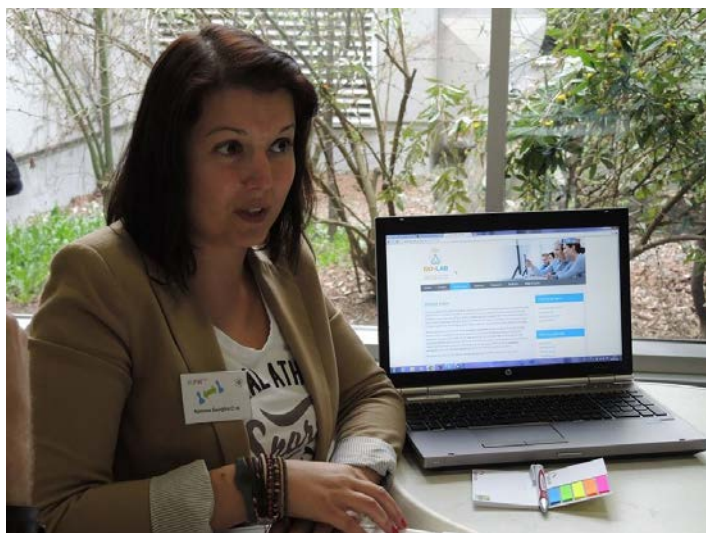
In the following the detailed reports from the activities are shown.

GO - LAB Event Code	AT13-030414
Context: standalone event or combined with other ws, online or face to face	Combined with others; Face to face
Country City/Region	Austria / Villach
Working language	German and English
Start/End Date	03.04.2014 1 hours
Organizing Institute	CUAS
Coordinator name and email	Amir Mujkanovic A.Mujkanovic@FH-Kaernten.at
Total number of teachers/schools	16 teachers from 10 secondary schools
Brief description	The Go-Lab portal and the Website were presented and teachers were encouraged to access it and spread the word to their colleagues. Teachers were asked to use the Radioactivity or the VISIR ILS and provide their feedback on the overall experience. Participates were particularly asked to use the scratchpad and the hypothesis tool included in the conclusion of the Radioactivity ILS.
Facilitators Observations	Teachers were engaged in the activities and the facilitators had the impression that they were interested and enjoyed working with the ILSs. They were impressed that they could explain the radioactivity to their students by using an experimentation apparatus that is located in Australia that is literally half way around the world from the actual user. They also saw a real benefit of the visualization of the emitted radioactive rays.
Common themes identified in the case studies	
Examples illustrating common themes	
Recommendations made by participants	<ul style="list-style-type: none"> - One teacher was particularly interested if there are any ILSs available that include experimentation related to Geography. - It would be useful to be able to export the notes made in the scratchpad that is embedded in the conclusion phase - ILSs in German are definitely needed - A better integration of ILSs into the particular curricula would be helpful for teachers.

Website	No website
Photos or other relevant material	No pictures available
Event agenda	<ul style="list-style-type: none">- Intro to Go-Lab Portal- Presentation of the Go-Lab Project Website- Individual usage of ILSs- Reflection of the used ILSs- Discussion

GO - LAB Report Code	AT13-030414
Title	Future learning methods for future jobs
Country City/Region	Austria / Villach
Working language	German and English
Start/End Date	Date: 03/04/2014; Time: 10:55 – 12:35
Partners Involved	Secondary schools from Villach
Coordinator name and email	Amir Mujkanovic A.Mujkanovic@FH-Kaernten.at
School Profile	Technical schools with bilingual teaching programs and profiles like mathematics, physics, chemistry, biology and informatics
Number and age of students	52 students from 4 secondary school, ≈14 years old
Activity Description	<p>The main goal was to introduce online laboratories embedded into the inquiry learning cycles.</p> <p>First they received a brief description of remote labs: what remote labs are, how you can connect to real hardware over Internet, how you can access equipment that is geographically detached from the user. This theoretical demonstration has been underpinned with a live demo of the Radioactivity and the VISIR labs.</p> <p>The objective was to gain an impression of students regarding the use of our labs. Students were asked for their feedback, particularly their preferences on how the presented ILSs could be improved.</p>
Implemented online labs	Radioactivity ILS; VISIR ILS;
Learning outcomes	<p>Students are interested in working with Online Labs or other learning tools that involve ICT. Some of them were interested in technical details. One student for example was interested in software programming that is related to providing lab equipment online. Most other students would like to use this kind of learning as an opportunity to research more and to use online laboratories as an additional tool.</p> <p>The overall impression was very positive. Students were engaged in the activities and enjoyed the learning experience with the labs. Most students suggested that these labs should be embedded in the classroom as additional activities. Some students however were not fully engaged in these activities but they would accept the usage of labs as an optional activity.</p> <p>Another observation was that students would prefer to have an introduction and guidance by their teachers when they use online labs for the first time.</p>

Photos or other
relevant material



GO - LAB Report Code	AT13-070714
Title	Implementation Activity
Country City/Region	Austria / Villach
Working language	German
Start/End Date	Date: 07/07/2014; Time: 10:00 – 11:00
Partners Involved	CUAS
Coordinator name and email	Amir Mujkanovic A.Mujkanovic@FH-Kaernten.at
School Profile	Various teachers from 6 different schools
Number and age of students	6 teachers
Activity Description	<p>The main goal was to introduce online laboratories embedded into the inquiry learning cycles.</p> <p>First they received a brief description of remote labs: what remote labs are, how you can connect to real hardware over Internet, how you can access equipment that is geographically detached from the user. This theoretical demonstration has been underpinned with a live demo of the Radioactivity labs.</p> <p>The objective was to gain an impression of teachers regarding the use of our labs. Teachers were asked for their feedback, particularly their preferences on how the presented ILSs could be improved.</p>
Implemented online labs	Radioactivity ILS
Learning outcomes	<p>Participants of this online workshop were interested in working with Online Labs and the Go-Lab infrastructure. Some of the participants promised to inform CUAS about upcoming conferences related to eLearning. These conferences might provide important opportunities for additional steps in the community building.</p> <p>Teachers used the Radioactivity ILS during the workshop. Some of them had technical difficulties accessing the lab that is embedded in the investigation phase. However, most of them could access the lab and perform the experiment.</p> <p>The facilitators' overall impression was very positive. Teachers were engaged in the activities and enjoyed the experience with the ILS.</p>

7.2 Belgium

EUN conducted and coordinated the implementation activities in Belgium, and also in France and Spain, listed in the table below. As already mentioned in other sections of the document, EUN has a European status rather than a national one and so its target audience, in terms of teachers and pilot schools, are coming from European countries in general and not only from the partner's host country. In this context three training activities for science teachers were organized, the two of which were combined visionary workshops with short hands-on sessions before the official Phase-A period, with 73 participants, where a variety of labs were introduced and practiced. The subject domains of these activities and labs were focused mainly on physics and astronomy.

Date(s)	Type	Participants (Schools)	Labs	Subject(s)
15/02/2014	Training of teachers	15 (15)	Hypatia, Galaxy-crash	Physics, Astronomy
02/03/2013	Training of teachers	28 (20)	Faulkes-Telescope, Aquarium, Hypatia, Sun4all, Cernland	Physics, Astronomy
10/03/2013	Training of teachers	30 (22)	Faulkes-Telescope, Aquarium, Hypatia, Sun4all, Cernland	Physics, Astronomy

In the following the detailed reports from the activities are shown.

GO - LAB Event Code	[BEEUN-150214]
Title	Go-Lab Inquiry Learning at Schools
Country City/Region	Belgium Brussels
Working language	English
Start/End Date	15/02/2014
Organizing Institute	European Schoolnet
Coordinator name and email	Evita Tasiopoulou Evita.tasiopoulou@eun.org
Activity Form	Workshop
Activity Type	International workshop with teachers from a variety of EU countries
Total number of teachers/schools	15
Implemented online labs	Hypatia, Galaxy crash
Brief description	<p>The aim of the workshop was to introduce teachers to Go-Lab and get them excited about the possibilities that the project has to offer to their teaching.</p> <p>The session started with an introduction to the project, its aims and main outcomes. A demonstration of two laboratories (Hypatia & Galaxy crash) followed. A quick introduction to the Go-Lab inquiry learning cycle and teachers' experience with inquiry learning has also taken place.</p> <p>The second part of the training focused on a hand on activity combined with the running Go-Lab competition. Teachers had the opportunity to go through the available laboratories and start working on a lesson plan/contribution to the competition.</p>
Learning outcomes	<p>After following this workshop, teachers have learnt the following:</p> <ul style="list-style-type: none"> - Aims and future outcomes of the project - Inquiry learning based cycle - Use of online laboratories & a few inspiring examples - How they can get involved and participate further to the project - Go-Lab competition

Photos or other
relevant material



GO - LAB Event Code	FREUN-020313
Title	Go-Lab Training and Visionary workshop
Country City/Region	France Tours
Working language	English
Start/End Date	02/03/2013
Organizing Institute	European Schoolnet
Coordinator name and email	Evita Tasiopoulou Evita.tasiopoulou@eun.org
Activity Form	Visionary workshop and Hands-on Training
Activity Type	International Workshop for teachers
Total number of teachers/schools	28 teachers from 20 schools
Implemented online labs	Faulkes Telescopes, Aquarium Web Lab, HYPATIA, Sun4all, CERNland
Brief description	<p>The Go-Lab Visionary workshop purpose was to show teachers the use of the remote lab and how it can be combined with the theoretical background and educational resources. The workshop was divided into two sections. The first part was devoted in the presentation of Go-Lab project, its aims and main benefits for teachers, students and laboratory owners.</p> <p>The second part was focused on hands on activities. Using the Day on Jupiter example, we guided teachers through a possible activity and reviewed the use of the inquiry based model. Then five online laboratories that will be included in Go-Lab were presented and teachers, split in small teams, had to spend a certain time working on a lesson plan based on one of the suggested laboratories (using IBSE).</p> <p>At the end, teachers presented their work to their colleagues and had the opportunity to talk about the challenges they face and the possibilities they see in the use of the Go-Lab portal.</p> <p>Finally participants have been asked to fill in an on-line survey in order to collect the main ideas of the groups and their overall feedback.</p>
Learning outcomes	Participants were expected to have an overall idea on the added value of on-line labs, the need for organizing them into a federation and how could Go-Lab assist them in their teaching by providing, a federation of labs, relative educational activities and supporting tools for their implementation.


**Photos or other
relevant material**



Event agenda

- Setting the tone (5')
- Short introduction of the project and its aims (10')
- Example (10')
- The need for a federation of online labs (10')
- Go-Lab vision (10')
- Working on their own scenarios (35')
- Address and answer the main questions (10')

GO - LAB Event Code	ESEUN-100313
Title	Go-Lab Training and Visionary workshop
Country City/Region	Spain Madrid
Working language	English
Start/End Date	10/03/2013
Organizing Institute	European Schoolnet
Coordinator name and email	Gina Mihai Gina.mihai@eun.org
Activity Form	Visionary workshop and Hands-on Training
Activity Type	International Workshop for teachers
Total number of teachers/schools	30 teachers from 22 schools
Implemented online labs	Faulkes Telescopes, Aquarium WebLab, HYPATIA, Sun4all, CERNland
Brief description	<p>The Go-Lab Visionary workshop purpose was to show teachers the use of the remote lab and how it can be combined with the theoretical background and educational resources. The workshop was divided into two sections. The first part was devoted in the presentation of Go-Lab project, its aims and main benefits for teachers, students and laboratory owners.</p> <p>The second part was focused on hands on activities. Using the Day on Jupiter example, we guided teachers through a possible activity and reviewed the use of the inquiry based model. Then five online laboratories that will be included in Go-Lab were presented and teachers, split in small teams, had to spend a certain time working on a lesson plan based on one of the suggested laboratories (using IBSE).</p> <p>At the end, teachers presented their work to their colleagues and had the opportunity to talk about the challenges they face and the possibilities they see in the use of the Go-Lab portal.</p> <p>Finally participants have been asked to fill in an on-line survey in order to collect the main ideas of the groups and their overall feedback.</p>
Learning outcomes	Participants were expected to have an overall idea on the added value of on-line labs, the need for organizing them into a federation and how could Go-Lab assist them in their teaching by providing, a federation of labs, relative educational activities and supporting tools for their implementation.

Website	n/a
Photos or other relevant material	
Event agenda	<ul style="list-style-type: none"> - Setting the tone (5') - Short introduction of the project and its aims (10') - Example (10') - The need for a federation of online labs (10') - Go-Lab vision (10') - Working on their own scenarios (35') - Address and answer the main questions (10')

7.3 Cyprus

UCY is the national coordinator of implementation in Cyprus. During Phase-A there were no activities to be reported since the schools and teachers contacted finally opted out to wait for implementation of the newer release of the GoLab platform (i.e. the repository of labs and ILSs and the authoring tool, graasp). In the period covered by this document UCY collaborated closely with two science teachers from local high-schools working on the design and development of lesson plans and ILS with the Electricity lab. The developed ILSs and support materials are planned to be utilized by pilot schools in Phase-B.

7.4 Estonia

UTE is the national coordinator of implementation in Estonia. The case is similar as above. In the Phase-A period UTE collaborated closely with four science teachers, in particular teachers of biology and chemistry, and worked on the design and development of lesson plans and ILSs with a set of proposed biology labs that were not on the repository at that time. The labs they proposed were officially reported to WP2 and are now included in the repository. The developed ILSs are planned to be utilized by pilot schools in Phase-B.

7.5 Germany

UDE is the national coordinator of implementation in Germany. During Phase-A there were no activities to be reported since the majority of schools and teachers contacted finally opted out to wait for implementation of the newer release of the GoLab platform (i.e. the repository of labs and ILSs and the authoring tool, graasp) with enriched content in terms of labs and subject domains. In the period covered by this document UDE collaborated closely with two science teachers from local high-schools working on the design and development of lesson plans and an ILS focusing on curriculum subjects of chemistry, environmental science and ecology. The developed ILS and proposed lab, Osmotic power, are planned to be utilized by pilot schools in Phase-B.

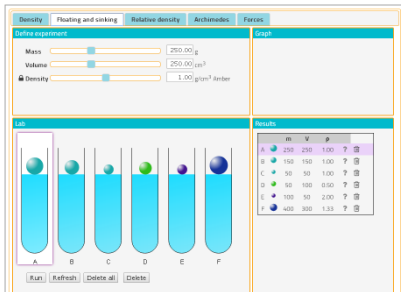


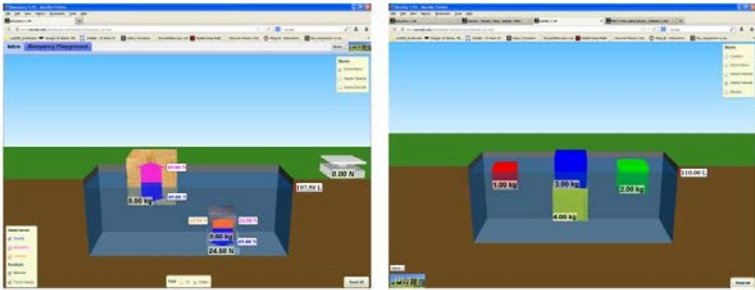
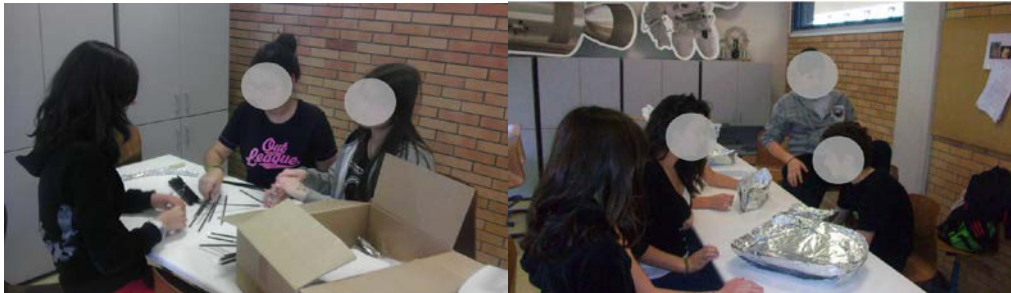
7.6 Greece

EA is the national coordinator of implementation in Greece. It organized a variety of training and educational activities for science teachers and students around the country. A lot of activities were also held in collaboration with IASA, the lab provider of HYPATIA. In total, in Phase-A there were 2 teacher training events, with 46 participants, and 9 activities with students, with 278 participants, on a variety of subjects and labs, covering physics, astronomy, maths and technology (see table below). In total 68 secondary schools were involved in these activities. Phase-A concluded with the Go-Lab Summer School, organized by EA in Marathon on 13-18 Jul 2014, in collaboration with partners of the consortium. The summer school was a week-long intensive course on the use of online labs in science education. 39 teachers from countries around Europe participated and developed 39 ILSs on various curriculum topics using in full the Go-Lab repository and authoring tool (details about the summer school and teachers contest are given in D6.4 [5]).

Partner(s)	Date(s)	Type	Participants (Schools)	Labs	Subject(s)
EA	01/02/2014 – 31/03/2014	Activity with students	10 (1)	Splash, PhET	Physics
EA	10/02/2014	Activity with students	20 (1)	ESA-SOHO dataset, SalsaJ, Geogebra	Maths, Physics, Astronomy
EA	11/03/2014	Activity with students	28 (1)	iSpyCMS	Physics, Technology
EA	01/04/2014 – 07/05/2014	Activity with students	35 (7)	Splash, PhET	Physics
EA, IASA	29/04/2014	Training of teachers	22 (19)	Hypatia	Physics
EA, IASA	20/05/2014	Training of teachers	24 (20)	Hypatia	Physics
EA	09/05/2014	Activity with students	42 (1)	iSpyCMS	Physics, Technology
IASA	24/01/2014	Activity with students	28 (4)	Hypatia	Physics
IASA	19/02/2014	Activity with students	25 (4)	Hypatia	Physics
IASA	04/02/2014	Activity with students	45 (5)	Hypatia	Physics
IASA	10/03/2014	Activity with students	45 (5)	Hypatia	Physics
EA (organizer) and EPFL, UOG, NUCLIO, UTE, ULEIC	13/07/2014 - 18/07/2014	Training of teachers	39 (38)	Faulkes Telescopes, Crashing Galaxies, SalsaJ, Craters, Electricity lab, Splash, HYPATIA	Physics, Technology, Biology, Ecology, Astronomy

In the following the detailed reports from the activities in Greece are shown.

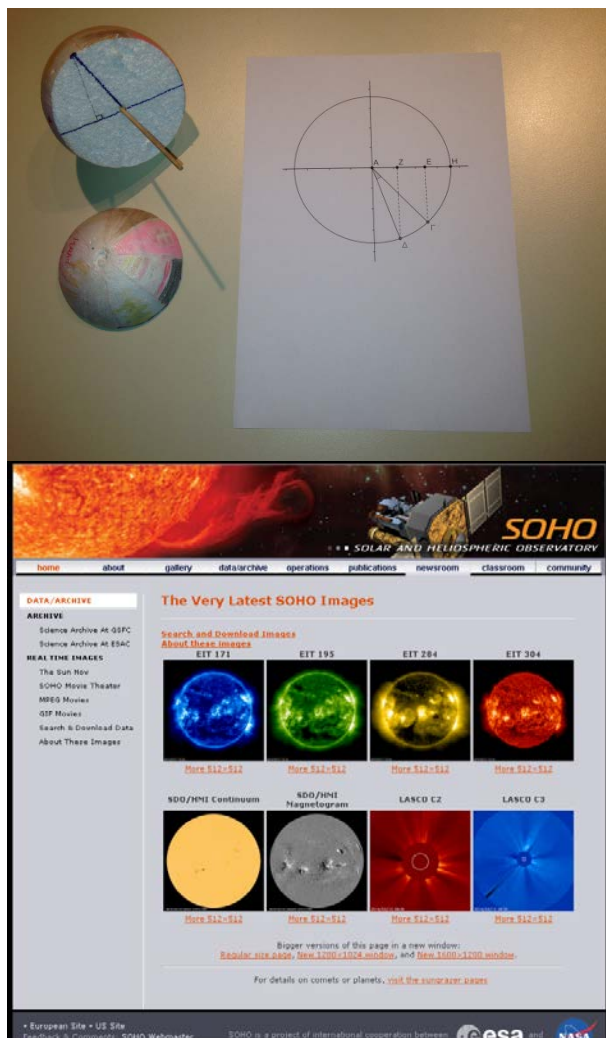
GO - LAB Report Code	GR02-01022014
Title	"Ship design" or "Little crafts and great challenges"
Country City/Region	Greece, Pallini Athens
Working language	Greek and English
Start/End Date	01/02/2014 – 31/03/2014
Partners Involved	EA
Coordinator name and email	G.Mavromanolakis gmavroma@ea.gr
School Profile	Junior high-school (Gymnasium) of Ellinogermaniki Agogi. The school and staff has proven track record on using innovative teaching methods and extra-curricular interdisciplinary educational activities
Number and age of students	10 junior high school students, age 13-15 years old
Activity Description	<p>The educational activity consists of a series of inquiry-learning sessions, each about two hours long. It is conducted on a weekly basis as extra-curricular project assignment for students with interests in STEM. It covers and complements the teaching of the following curriculum subjects: physics, maths, technology and engineering. In this activity students split into groups and use a professional tool to design a ship to carry a payload. They build a model with simple materials and test it in a physical lab. They elaborate their knowledge with virtual or remote labs and simulations. In the final stage of the activity the teams of students may compete with their models in a swimming pool.</p> <p>In brief the activity develops as the following: students start by experimenting with the use of a virtual lab or simulation to learn and elaborate on subjects like forces, buoyancy, weight, mass, density (all these have direct connection to science curriculum of middle or high school level). They then split into teams and are assigned/challenged to build a water-tight, strong, stable, streamlined vessel to carry a payload using only certain every-day life low-cost materials (e.g. skewers, aluminum foil and baking paper). They study, test and improve their design and construction in a physical lab (with water tank and dynamometers). They have also to document (written report) and communicate (presentation/poster) the various steps of their project. At the end the teams compete with their models in a swimming pool using simple pulling mechanisms (fishing reels).</p> <p>One of the main advantages of this activity is that it consists of several sub-activities each of which gives the flexibility to the teacher to introduce inquiry-based approach of various subjects of the science curriculum such as forces, motion, Newton's laws, equilibrium, buoyancy, mass, density etc. and let the students to acquire, develop and explore the relevant knowledge. Also a key</p>

	feature of the activity is that it is interdisciplinary and in addition gives to teachers the opportunity to expand it with teaching subjects like technology, history of technology, engineering etc.
Implemented online labs	Splash, PhET simulations
Learning outcomes	Through inquiry, and experimentation using both physical and virtual labs, students acquire content and concept knowledge on subjects like forces, motion, Newton's laws, equilibrium, buoyancy, structural stability, modeling, engineering practices and principles, properties of materials, etc. Through group work they also improve their social and verbal skills (collaboration, communication, presentation, project management) and develop key competencies (creativity, innovative thinking, problem solving, digital literacy).
Photos or other relevant material	    

GO - LAB Report Code	GR02-10022014
Title	High school students measure the self-rotation period of the Sun
Country City/Region	Greece, Pallini Athens
Working language	Greek and English
Start/End Date	10/02/2014
Partners Involved	EA
Coordinator name and email	G.Mavromanolakis gmavroma@ea.gr
School Profile	High-school (Lyceum) of Ellinogermaniki Agogi. The school and staff has proven track record on using innovative teaching methods and extra-curricular interdisciplinary educational activities
Number and age of students	20 high school students, age 16-17 years old
Activity Description	<p>The teaching activity was developed in collaboration with maths and physics teachers and is directly linked to the maths/geometry and physics curriculum (specific topics: trigonometry functions, circular motion). In this activity students measure the Sun's self-rotation period by using real data from the spacecraft SOHO and applying a simple mathematical formula which they have derived. By investigating an engaging question like "Does the Sun rotate?" or "Is the Sun a solid object?" they get a better understanding of the relation between maths, science and technology.</p> <p>Usually students complain that they find no interest in maths and relevant subjects like geometry, algebra and trigonometry because they are too abstract or have no relation to their everyday life. This activity is designed to demonstrate to students the relation of mathematics to science and technology. Students are first asked to solve a simple problem of geometry and derive a formula which is then applied to answer an engaging question like "Does the Sun rotate?" or "Is the Sun a solid object?" They then use images of sunspots taken from the spacecraft SOHO (solar heliospheric observatory) and with the help of simple image processing software and the application of the derived formula can actually measure the Sun's period of self-rotation or the differential rotation across latitude. Before they are guided to do so they can make various hypotheses on how or what is the correct answer. At the end of the activity they can compare their results and also discuss how a simple abstract formula can be applied in answering a scientific question.</p>
Implemented online labs	ESA-SOHO dataset, SalsaJ, Geogebra

Learning outcomes

Students get a better understanding of the relation between maths, science and technology. They use real scientific data to answer a scientific question. They develop and practice their digital skills by using online resources and tools.

Photos or other relevant material

GO - LAB Report Code	GR02-11032014
Title	High school students analyze data from particle physics experiment at CERN
Country City/Region	Greece, Athens
Working language	Greek and English
Start/End Date	11/03/2014
Partners Involved	EA
Coordinator name and email	G.Mavromanolakis gmavroma@ea.gr
School Profile	High-school "Platon" (Lyceum). The school has long tradition of participation in EU educational projects and on implementing innovative teaching methods and technologies
Number and age of students	28 (2 classes) of high school students, age 16-17 years old
Activity Description	The educational activity consists of two parts, each about two hours long, implemented on 11/03/2014 and on 10/04/2014 respectively. In the former part students attend a lecture by G. Mavromanolakis (former researcher at CERN) on particle physics research, science and technology. This is followed by a virtual visit to CERN in live connection with other schools around the country (see photo below). In the second part of the activity students analyze data from the CMS particle physics experiment at the Large Hadron Collider of CERN using the iSpyCMS online lab (dataset and event display/analysis tool).
Implemented online labs	iSpyCMS (dataset and event display/analysis)
Learning outcomes	Students get a better understanding how frontier scientific research is conducted, how cutting edge technologies are developed, what is the everyday job of researchers, scientists and engineers is in a large international research center etc. They use real scientific data to investigate and answer a scientific question. They develop and practice their digital skills by using online resources and tools. They understand how abstract concepts from their physics curriculum like the principles of "conservation of energy and momentum" and "conservation of charge" are applied and manifested in the microcosmos.

Photos or other
relevant material



Public Data

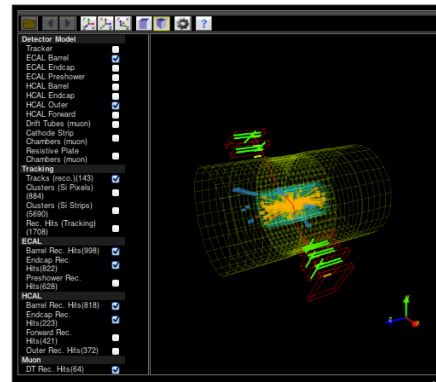
Data Samples
Analysis Tools and
Formats
CMS Masterclasses
Useful links

CMS Data for the Public

The CMS experiment at the LHC has released a portion of its data to the public for use in education and outreach. Explore this page to find out more about the data and how to analyse it yourself.

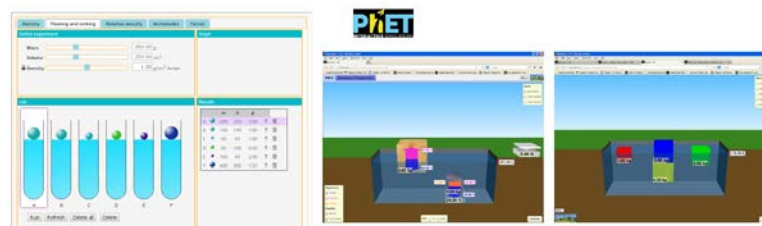
Try the online event display below. Ctrl+Mouse to move and Shift+Mouse to zoom.

Follow the links at left to access the full version of the display and thousands of events.



GO - LAB Report Code	GR02-01042014
Title	"Little crafts and great challenges" educational contest for junior high school students
Country City/Region	Greece, Kerkyra
Working language	Greek
Start/End Date	01/04/2014 – 07/05/2014
Partners Involved	EA
Coordinator name and email	G.Mavromanolakis gmavroma@ea.gr The contest conducted in collaboration with the Regional Center of Science Education (Εργαστηριακό Κέντρο Φυσικών Επιστημών Κέρκυρας) and the local School Counselor
School Profile	13 student teams from 7 rural and urban junior high-schools (Gymnasia) of Kerkyra island. The local community of teachers, principal and counselor of science education, have proven track record on innovative teaching and organization of extra-curricular interdisciplinary educational activities and contests
Number and age of students	35 (20 male, 15 female) junior high school students, age 13-15 years old
Activity Description	The activity "Little crafts and great challenges" was formed as a science and technology contest for schools (pictures shown below is from the relevant webpage with description/registration for the contest). It involves a collection of inquiry activities related to several science subjects including physics, maths, technology and engineering. In these series of activities students form teams and are challenged to design, study and build a ship with certain only materials to carry a payload. They build a model with simple materials and test it in a physical lab. They elaborate their knowledge with virtual labs (ie Splash) and simulations (PhET applets). At the end they have to make a presentation about their project. In the final stage of the activity the teams of students compete with their models in a water pool. The final part of the contest was kindly hosted by the local sailing club (see photos below).
Implemented online labs	Splash, PhET simulations
Learning outcomes	Through inquiry, and experimentation using both physical and virtual labs, students acquire content and concept knowledge on subjects like forces, motion, Newton's laws, equilibrium, buoyancy, structural stability, modeling, engineering practices and principles, properties of materials, etc. Through group work they also improve their social and verbal skills (collaboration, communication, presentation, project management) and develop key competencies (creativity, innovative thinking, problem solving, digital literacy).

Photos or other
relevant material



GO - LAB Event Code	GR02-29042014 GR02-20052014
Title	Επιστημονικές πειραματικές διατάξεις και εικονικά πειράματα στην υπηρεσία της εκπαιδευτικής διαδικασίας Scientific experimental set-ups and virtual laboratories for science teaching at schools
Country City/Region	Greece, Athens
Working language	Greek
Start/End Date	29/04/2014 and 20/05/2014
Organizing Institute	EA, IASA
Coordinator name and email	G. Mavromanolakis S. Vourakis, C.Kourkouvelis
Activity Form	Hypatia Training Workshops
Activity Type	Local
Total number of teachers/school	22+24 teachers (19+20 schools)
Implemented online labs	Hypatia lab and related ILSs
Brief description	Various training workshops for teachers were organized in collaboration with the Eugenides Foundation which hosted the CERN Exhibition "Accelerating Science" (co-organized by CERN and EA). On two occasions, on 29/04/2014 and on 20/05/2014 there were hands-on training workshops on Hypatia lab and related ILSs (see attached agenda).
Learning outcomes	The participant teachers get an overall idea on the use of online labs in science teaching, the need for organizing them into a federation and how could Go-Lab assist them in their teaching by providing, a federation of labs, example educational activities and supporting tools for their implementation in an integrated platform. They then practice the use of Hypatia and related Inquiry Learning Spaces.
Website	http://ea.gr/cern http://ea.gr/cern/workshop_A.pdf
Photos or other relevant material	Announcement/invitation letter and agenda in greek

"ΕΠΙΤΑΧΥΝΟΝΤΑΣ"
την
Επιστήμη

Η Διαδραστική Έκθεση του CERN στην Αθήνα
Ιδρυμα Ευγενίδου | 12 Απριλίου-31 Μαΐου, 2014

Η Έκθεση • Κεντρική Εκδήλωση • Εκπαιδευτικές Δραστηριότητες • Πληροφορίες

Εκπαιδευτικές Δραστηριότητες

Με αφορμή την φιλοξενία της έκθεσης του CERN στην Αθήνα, το Τμήμα Έρευνας και Ανάπτυξης της Ελληνογερμανικής Αγογής, η Ένωση Ελλήνων Φυσικών, το Ινστιτούτο Επιταχυντικών Συστημάτων και Εφαρμογών του Εθνικού και Καποδιστριακού Πανεπιστημίου Αθηνών, διοργανώνουν επιμορφωτικά σεμινάρια για εκπαιδευτικούς με στόχο την παρουσίαση

Πρόγραμμα Επιμορφωτικών Σεμιναρίων

	ΑΠΡ.	ΜΑΙΟΣ
ΔΕΥ.	28	5 12 19 26
ΤΡΙ.	29	6 13 20 27

Για να δείτε τις γενικές πληροφορίες πατήστε [εδώ](#).

Οι εκπαιδευτικές εφαρμογές του CERN στο διαδίκτυο

Οργάνωσε την εκπαιδευτική σου διαδρομή στην έκθεση του CERN

Μάθε για το CERN μέσα από το κινητό σου τηλέφωνο

Μεταφέρε το πείραμα του αιώνα στο σχολικό εργαστήριο

Διοργάνωση: Η οργάνωση της έκθεσης υποστηρίζεται από το έργο: **inspiring SCIENCE** education

Event agenda



Το πείραμα του αιώνα στο Σχολικό Εργαστήριο

- **15:00-15:30** Η Επιστημονική Μεθοδολογία στην Εκπαιδευτική Πράξη. Εισαγωγή στο μοντέλο της Διερευνητικής Μάθησης
- **15:30-16:00** Εργαλεία και εφαρμογές για την σύνδεση του CERN με την σχολική τάξη. Παρουσίαση εκπαιδευτικών εργαλείων για την σύνδεση των πειραμάτων του CERN με το αναλυτικό πρόγραμμα.
- **16:00-17:00** Σχεδιάζοντας δραστηριότητες για το αναλυτικό πρόγραμμα. Πρακτική εφαρμογή εκπαιδευτικού σεναρίου που περιλαμβάνει την χρήση του εργαλείου HYPATIA, για την ανάλυση πραγματικών δεδομένων από το πείραμα ATLAS του CERN.

Το παραπάνω επιμορφωτικό εργαστήριο προγραμματίζεται να πραγματοποιηθεί στις: 29/4, 5/5, 12/5, και 20/5, ώρες 15:00-17:00 και μπορούν να το παρακολουθήσουν εκπαιδευτικοί τόσο της πρωτοβάθμιας όσο και της δευτεροβάθμιας εκπαίδευσης.

Η συμμετοχή στο εκπαιδευτικό πρόγραμμα είναι δωρεάν, απαραίτητη όμως είναι η κράτηση θέσης στα τηλέφωνα 210 9469631 και 632 ώρες 09:00-15:00 (Δευτέρα έως Πέμπτη: 8.30-20.00, Παρασκευή και Σάββατο: 8.30-15.30). Σε όλους τους συμμετέχοντες θα δοθεί βεβαίωση παρακολούθησης.

Σημειώνεται ότι οι χώροι του Ιδρύματος Ευγενίδου είναι προσβάσιμοι και φιλικόι σε ανθρώπους με κινητική αναπηρία, ενώ υπάρχει η δυνατότητα διερμηνείας στην Ελληνική Νοηματική Γλώσσα κατόπιν έγκαιρης επικοινωνίας με γραπτό μήνυμα στο τηλέφωνο: 6936 177 143, στο fax: 210 9417514, ή στην ηλεκτρονική διεύθυνση: pr@eugenfound.edu.gr.



GO - LAB Report Code	GR02-09052014
Title	High school students analyze data from particle physics experiment at CERN
Country City/Region	Greece, Glyfada
Working language	Greek and English
Start/End Date	09/05/2014
Partners Involved	EA
Coordinator name and email	G.Mavromanolakis gmavroma@ea.gr
School Profile	3 rd junior high-school of Glyfada. It is an urban state school with pioneering teachers. They have developed innovative STEM teaching e.g educational robotics and participated in various national science contests for teachers and students
Number and age of students	42 (2 classes) of high school students, age 16-17 years old
Activity Description	The educational activity starts with a lecture by G. Mavromanolakis (former researcher at CERN) on particle physics research, science and technology. Then students analyze data from the CMS particle physics experiment at the Large Hadron Collider of CERN using the iSpyCMS online lab (dataset and event display/analysis tool).
Implemented online labs	iSpyCMS (dataset and event display/analysis)
Learning outcomes	Students get a better understanding how frontier scientific research is conducted, how cutting edge technologies are developed, what is the everyday job of researchers, scientists and engineers is in a large international research center etc. They use real scientific data to investigate and answer a scientific question. They develop and practice their digital skills by using online resources and tools. They understand how abstract concepts from their physics curriculum like the principles of “conservation of energy and momentum” and “conservation of charge” are applied and manifested in the microcosmos.

Photos or other
relevant material



Public Data

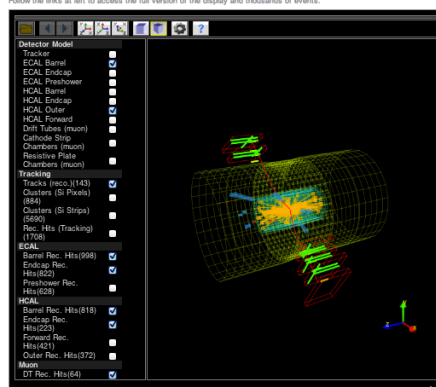
Data Samples
Analysis Tools and
Formats
CMS Masterclass
Useful links

CMS Data for the Public

The CMS experiment at the LHC has released a portion of its data to the public for use in education and outreach. Explore this page to find out more about the data and how to analyse it yourself.

Try the online event display below. Ctrl+Mouse to move and Shift+Mouse to zoom.

Follow the links at left to access the full version of the display and thousands of events.




GO - LAB Report Code	GR18-240114
Title	Half day workshops on HYPATIA and the ATLAS experiment in Lyceums of Chalkida
Country City/Region	Greece, Chalkida
Working language	Greek
Start/End Date	24/01/2014 and 19/02/2014
Partners Involved	IASA
Coordinator name and email	Christine Kourkouvelis, hkourkou@phys.uoa.gr
Number and age of students	28 high school students and 5 teachers from 4 schools 25 high school students and 6 teachers from 4 schools
Activity Description	<p>The objective of the mini masterclass was to present the ATLAS experiment, the Go-Lab project and the Go-Lab repository. The students were introduced to the on-line event analysis tool and performed measurements on their own guided by members of the team. They also followed a virtual visit to CERN and had the opportunity to ask questions to the researchers present at CERN. This was in the framework of their future visits to CERN</p> <p>Program of the day:</p> <p>9:30-10:30 Introduction to the ATLAS and the new Boson (C.Kourkouvelis)</p> <p>11:00-11:30 Introduction to HYPATIA and the on-line analysis (S.Vourakis)</p> <p>11:30-13:00 Hands-on lab at the school's computer lab (S.Vourakis and G.Vasileiadis)</p> <p>13:00 – 14:00 Virtual Visit to the ATLAS experiment at CERN</p>
Implemented online labs	HYPATIA lab and ILSs
Learning outcomes	<ul style="list-style-type: none"> - Acquaintance with the Go-Lab project - Familiarization with Go-Lab ILSs and online labs - Familiarization with the HYPATIA event analysis tool

GO - LAB Report Code	GR18-040214								
Title	Half day workshop on HYPATIA and the ATLAS experiment in Lyceums in the area of Argos								
Country City/Region	Greece, Argos								
Working language	Greek								
Start/End Date	04/02/2014								
Partners Involved	IASA								
Coordinator name and email	Christine Kourkouvelis, hkourkou@phys.uoa.gr								
Number and age of students	45 high school students and 5 teachers from 5 schools								
Activity Description	<p>The objective of the mini masterclass was to present the ATLAS experiment, the Go-Lab project and the Go-Lab repository. The students were introduced to the on-line event analysis tool and performed measurements on their own guided by members of the team. They also followed a virtual visit to CERN and had the opportunity to ask questions to the researchers present at CERN.</p> <p>Program of the day:</p> <table> <tr> <td>9:30-10:30</td><td>Introduction to the ATLAS and the new Boson (C.Kourkouvelis)</td></tr> <tr> <td>11:00-11:30</td><td>Introduction to HYPATIA and the on-line analysis (S.Vourakis)</td></tr> <tr> <td>11:30-13:00</td><td>Hands-on lab at the school's computer lab (S.Vourakis and G.Vasileiadis)</td></tr> <tr> <td>13:00 – 14:00</td><td>Virtual Visit to the ATLAS experiment at CERN</td></tr> </table>	9:30-10:30	Introduction to the ATLAS and the new Boson (C.Kourkouvelis)	11:00-11:30	Introduction to HYPATIA and the on-line analysis (S.Vourakis)	11:30-13:00	Hands-on lab at the school's computer lab (S.Vourakis and G.Vasileiadis)	13:00 – 14:00	Virtual Visit to the ATLAS experiment at CERN
9:30-10:30	Introduction to the ATLAS and the new Boson (C.Kourkouvelis)								
11:00-11:30	Introduction to HYPATIA and the on-line analysis (S.Vourakis)								
11:30-13:00	Hands-on lab at the school's computer lab (S.Vourakis and G.Vasileiadis)								
13:00 – 14:00	Virtual Visit to the ATLAS experiment at CERN								
Implemented online labs	HYPATIA lab and ILSs								
Learning outcomes	<ul style="list-style-type: none"> - Acquaintance with the Go-Lab project - Familiarization with Go-Lab ILSs and online labs - Familiarization with the HYPATIA event analysis tool 								

GO - LAB Report Code	GR18-100314								
Title	Workshop on HYPATIA and the ATLAS experiment in Lyceums in the area of Katerini								
Country City/Region	Greece, Katerini								
Working language	Greek								
Start/End Date	10/03/2014								
Partners Involved	IASA								
Coordinator name and email	Christine Kourkouvelis, hhourkou@phys.uoa.gr								
Number and age of students	45 high school students and 8 teachers from 5 schools								
Activity Description	<p>The objective of the mini masterclass was to present the ATLAS experiment, the Go-Lab project and the Go-Lab repository. The students were introduced to the on-line event analysis tool and performed measurements on their own guided by members of the team. They also followed a virtual visit to CERN and had the opportunity to ask questions to the researchers present at CERN.</p> <p>Program of the day:</p> <table> <tr> <td>9:30-10:30</td><td>Introduction to the ATLAS and the new Boson (C.Kourkouvelis)</td></tr> <tr> <td>11:00-11:30</td><td>Introduction to HYPATIA and the on-line analysis (S.Vourakis)</td></tr> <tr> <td>11:30-13:00</td><td>Hands-on lab at the school's computer lab (S.Vourakis and G.Vasileiadis)</td></tr> <tr> <td>13:00 – 14:00</td><td>Virtual Visit to the ATLAS experiment at CERN (in connection with 11 other schools from all over Greece)</td></tr> </table>	9:30-10:30	Introduction to the ATLAS and the new Boson (C.Kourkouvelis)	11:00-11:30	Introduction to HYPATIA and the on-line analysis (S.Vourakis)	11:30-13:00	Hands-on lab at the school's computer lab (S.Vourakis and G.Vasileiadis)	13:00 – 14:00	Virtual Visit to the ATLAS experiment at CERN (in connection with 11 other schools from all over Greece)
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11:00-11:30	Introduction to HYPATIA and the on-line analysis (S.Vourakis)								
11:30-13:00	Hands-on lab at the school's computer lab (S.Vourakis and G.Vasileiadis)								
13:00 – 14:00	Virtual Visit to the ATLAS experiment at CERN (in connection with 11 other schools from all over Greece)								
Implemented online labs	HYPATIA lab and ILSs								
Learning outcomes	<ul style="list-style-type: none"> - Acquaintance with the Go-Lab project - Familiarization with Go-Lab ILSs and online labs - Familiarization with the HYPATIA event analysis tool 								

G O - L A B Event Code	[GR02-130714]
Title	International Science Teachers Training Course
Country City/Region	Marathon, Greece
Working language	English
Start/End Date	13/07/2014 – 18/07/2014
Organizing Institute	Ellinogermaniki Agogi
Coordinator name and email	Tsourlidaki Eleftheria <i>eleftheria@ea.gr</i> Mavromanolakis Georgios <i>gmavroma@ea.gr</i> Sofoklis Sotiriou <i>sotiriou@ea.gr</i>
Go-Lab Partners that were also Involved	Adrian Holzer (EPFL) Matthias Heintz (ULEIC) Rob Edlin White (ULEIC) Fraser Lewis (UOG) Gina Mihai (EUN) Urmaz Heinste (UTE) Leo Siiman (UTE) Christine Kourkouvelis (IASA) Rosa Doran (NUCLIO) Alexandros Trichos (CERTH) Vassilis Fasoulis (MENON)
Activity Form	Summer School
Activity Type	International
Total number of teachers/schools	39/38
Implemented online labs	Faulkes Telescopes Crashing Galaxies SalsaJ Craters on Earth and Other Planets Electricity lab Splash: Virtual Buoyancy Laboratory HYPATIA
Brief description	Summer School for introducing to teachers the IBSE teaching approach and the use of on-line labs.

Learning outcomes	Familiarization with the Go-Lab project Training on the use of the Go-Lab learning space and related tools. Acquaintance with the IBSE approach. Acquaintance with the “Big Ideas of Science”
Website	http://golab2014.ea.gr/
Photos or other relevant material	



Global Online Science Labs for Inquiry Learning at School
GO-LAB Summer School 2014
 Greece | 13/07 - 18/07 2014

About Programme How to Apply Location Fees Organizers Registration Contact Us

Golden Coast Hotel & Bungalows
 Marathon, Greece

Go-Lab Contest
 See here the website of the Go-Lab contest.

Practical Links
 Click here to download Practical info about the school and your stay.

Brochure/Leaflet
 Click here to download the Brochure of the Summer School

WELCOME TO THE GO-LAB SUMMER SCHOOL 2014

Event agenda

GO-LAB SUMMER SCHOOL						
PROGRAMME						
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
	13 July 2014	14 July 2014	15 July 2014	16 July 2014	17 July 2014	18 July 2014
09:30 to 12:30	Participants' Arrivals and Registration	Presentation of the Go-Lab project Eleftheria Tsourlidaki Ellinogermaniki Agogi Working with Go-Lab labs: Asteroid impacts on Earth Fraser Lewis University of South Wales	Presentation of the Go-Lab tools Adrian Holtzer Ecole Polytechnique Fédérale de Lausanne Practice on using the Go-Lab tools Eleftheria Tsourlidaki and Georgios Mavromanolakis Ellinogermaniki Agogi	Visit to Ellinogermaniki Agogi School Combining online and offline activities Eleftheria Tsourlidaki Ellinogermaniki Agogi Speakout loud: Shape our design on Splash ILS Rob Edlin-White and Matthias Heintz University of Leicester	Showing our students the bigger picture through a federation of online labs Eleftheria Tsourlidaki Ellinogermaniki Agogi The significance of misconceptions Georgios Mavromanolakis Ellinogermaniki Agogi Speakout louder: Spark our design on Electricity ILS and other scaffolds Rob Edlin-White and Matthias Heintz University of Leicester	Participants' Presentations, reflection and certificates Closing Lecture (12:30 - 13:30) Environmental literacy: Covering knowledge, attitudes and behaviour at green outreach sites Franz Bogner University of Bayreuth
15:00 to 17:00	Opening Session (18:00 - 21:00) From Big Bang to Black Holes Rosa Doran NUCLEIO The importance of Geospatial Thinking Marinos Kavouras National Technical University of Athens Quantum Physics and Entrepreneurship Renaat Frans KHLim Centre for Subject Matter Teaching STEM and Literacies: the School Innovation Perspective Nikitas Kastis MENOV Network	Practice in using the Go-Lab learning spaces Georgios Mavromanolakis Ellinogermaniki Agogi Working with Inquiry Eleftheria Tsourlidaki Ellinogermaniki Agogi Visit at Cape Sounio, Sanctuary of Poseidon	Practice on using the Go-Lab tools Eleftheria Tsourlidaki Ellinogermaniki Agogi and Georgios Mavromanolakis Ellinogermaniki Agogi	Visit to the Acropolis Museum and the Acropolis Dinner	Group work with the Go-Lab tools Eleftheria Tsourlidaki and Georgios Mavromanolakis Ellinogermaniki Agogi Invited Lecture (17:00 - 18:00) Scientix workshop Gina Mihai European Schoolnet Farewell Dinner	Participants' Departures

7.7 The Netherlands

UT is the national coordinator of implementation in the Netherlands. It is also the lab provider/owner of several online virtual labs for inquiry teaching, such as Splash and Electricity lab. During Phase-A it organized 6 activities with 4 schools where 230 students participated. The focus was on physics curriculum utilizing the Splash and Electricity labs and the associated ILSSs.

Date(s)	Type	Participants (Schools)	Labs	Subject(s)
24/03/2014 25/03/2014	Activity with students	27 (1)	Splash	Physics
14/04/2014 23/04/2014	Activity with students	90 (1)	Splash	Physics
15/05/2014 28/05/2014	Activity with students	60 (1)	Splash	Physics
23/06/2014 27/06/2014	Activity with students	53 (1)	Electricity lab	Physics

In the following the detailed reports from the activities are shown.

GO - LAB Report Code	NL01-240314
Title	Two lessons about Sinking and floating
Country City/Region	The Netherlands, Ermelo
Working language	English and Dutch
Start/End Date	24032014 - 25032014
Partners Involved	UT
Coordinator name and email	Henny Leemkuil, h.h.leemkuil@utwente.nl
School Profile	Christelijk College Groevenbeek is a school for all levels of secondary education (except gymnasium). It also has a bilingual track in which part of the lessons are in English (amongst them the lessons in Science).
Number and age of students	27 third grade students of a bilingual class, 14-15 years
Activity Description	In two Science lessons they used the Hypothesis Scratchpad, the Experimental Design Tool and Splash to plan and perform experiments. They filled in questionnaires about the tools and the lab.
Implemented online labs	Splash
Learning outcomes	What physical quantities are important in determining whether an object floats or sinks?
Photos or other relevant material	

DensityFloating and sinkingRelative densityArchimedesForces

Define experiment

Mass50.00 g

Volume50.00 cm³

Fluid0.79 g/cm³ Acetone

Graph


Lab

RunRefreshDelete allDelete

Results

	m	V	Fluid	
A	250	250	1.00	★
B	150	150	1.02	★
C	50	50	0.79	★
D	50	100	1.00	★
E	100	50	1.00	★
F	400	300	1.00	★

3. 50 50 1.00 4. 50 100 1.00 5. 100 50 1.00 6. 400 300 1.00 7. 150 150 1.02 8. 50 50 1.02 9. 50 50 0.79

GO - LAB Report Code	[NL01-14042014]
Title	Siswa's experiment 1
Country City/Region	The Netherlands, Hengelo
Working language	Dutch
Start/End Date	14042014 - 23042014
Partners Involved	UT
Coordinator name and email	Henny Leemkuil, h.h.leemkuil@utwente.nl
School Profile	Lyceum de Grundel is a school for the higher levels of secondary education (havo, atheneum and gymnasium). Except for the traditional subjects there is an examination subject "Nature, life and technology". There is also a lot of attention for Science in the curriculum.
Number and age of students	3 classes, about 90 students in total, 3th year, age 14-15
Activity Description	4 lessons. In the first lesson students the students got a pretest on the subject of buoyancy. In the following two lessons they planned and conducted experiments using the EDT and Splash. In the fourth lesson the students got a posttest.
Implemented online labs	Splash
Learning outcomes	This lab consists of four learning phases in which students discover (1) the relationship between mass, volume and density, (2) the relationship between densities of different solids and fluids, (3) properties that affect the floating or sinking of objects, and (4) Archimedes' principle
Photos or other relevant material	

Introductie

Je gaat experimenten plannen en uitvoeren in een online laboratorium om uit te vinden waardoor voorwerpen drijven, zweven* of zinken. Voer experimenten uit om de onderzoeksvraag te beantwoorden die straks bovenaan het scherm zal verschijnen. Denk goed na over de experimenten die je wilt voeren om de vraag te kunnen beantwoorden!

* Zweven = Een voorwerp zweeft wanneer het niet aan de oppervlakte van het water drijft, maar ook niet naar de bodem zinkt.


1. Maak van tevoren een planning van de experimenten die je uit gaat voeren. Gebruik hiervoor een vel papier.
2. Als je klaar bent met je planning, voer je je experimenten uit in het online laboratorium.
3. Wanneer je denkt genoeg experimenten te hebben uitgevoerd om de onderzoeksvraag te beantwoorden, analyseer je de resultaten en noteer je je antwoord in het vak "conclusie".
4. Wanneer je tevreden bent met je conclusie, sla je deze op om door te gaan naar de volgende onderzoeksvraag.

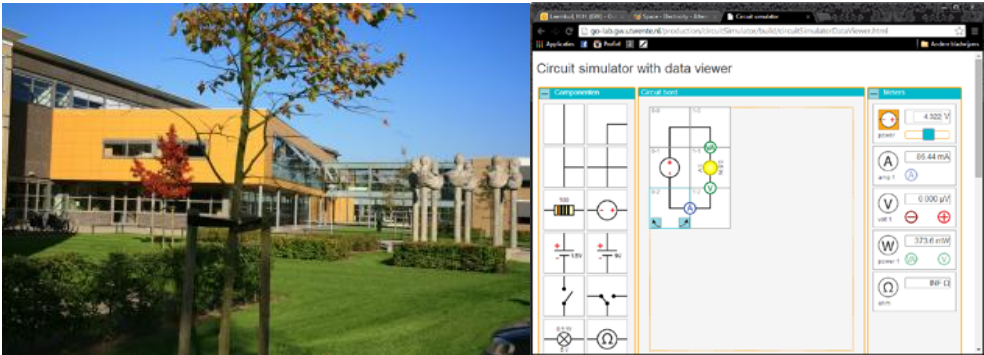
[Ga door](#)

Voer je gebruikersnaam in

Naam

[OK](#)

GO - LAB Report Code	[NL01-15052014]
Title	Siswa's experiment 2
Country City/Region	The Netherlands, Enschede
Working language	Dutch
Start/End Date	15052014- 28-052014
Partners Involved	UT
Coordinator name and email	Henny Leemkuil, h.h.leemkuil@utwente.nl
School Profile	Boenhoeffer College is an oecumenical school for all levels of secondary education, with about 4500 students spread over 6 locations. An important theme in the school is internationalization.
Number and age of students	2 classes, about 60 students in total, 3th year, age 14-15
Activity Description	4 lessons. In the first lesson students the students got a pretest on the subject of buoyancy. In the following two lessons they planned and conducted experiments using the EDT and Splash. In the fourth lesson the students got a posttest.
Implemented online labs	Splash
Learning outcomes	This lab consists of four learning phases in which students discover (1) the relationship between mass, volume and density, (2) the relationship between densities of different solids and fluids, (3) properties that affect the floating or sinking of objects, and (4) Archimedes' principle
Photos or other relevant material	

GO - LAB Report Code	NL01-230614
Title	Two lessons about Electric circuits
Country City/Region	The Netherlands, Ermelo
Working language	English and Dutch
Start/End Date	23062014 – 27062014
Partners Involved	UT
Coordinator name and email	Henny Leemkuil, h.h.leemkuil@utwente.nl
School Profile	Christelijk College Groevenbeek is a school for all levels of secondary education (except gymnasium). It also has a bilingual track in which part of the lessons are in English (amongst them the lessons in Science).
Number and age of students	27 third grade students of a bilingual class, 14-15 years 26 fourth grade students (HAVO), 15-16 years
Activity Description	In two Science/Physics lessons they used the Electricity lab to build several circuits and to do measurements. They had to make a report with pictures of circuits and data, their hypothesis and conclusions. At the end of the second lesson they filled in a questionnaire about the usability of the lab.
Implemented online labs	Electricity lab
Learning outcomes	Students can describe what the influence is of series and parallel circuits on current and voltage. Students can deduce how big the voltage and current will be in a circuit with three (or more) light bulbs.
Photos or other relevant material	



The Science class heard that they won a price for a project that they participated in.

7.8 Portugal

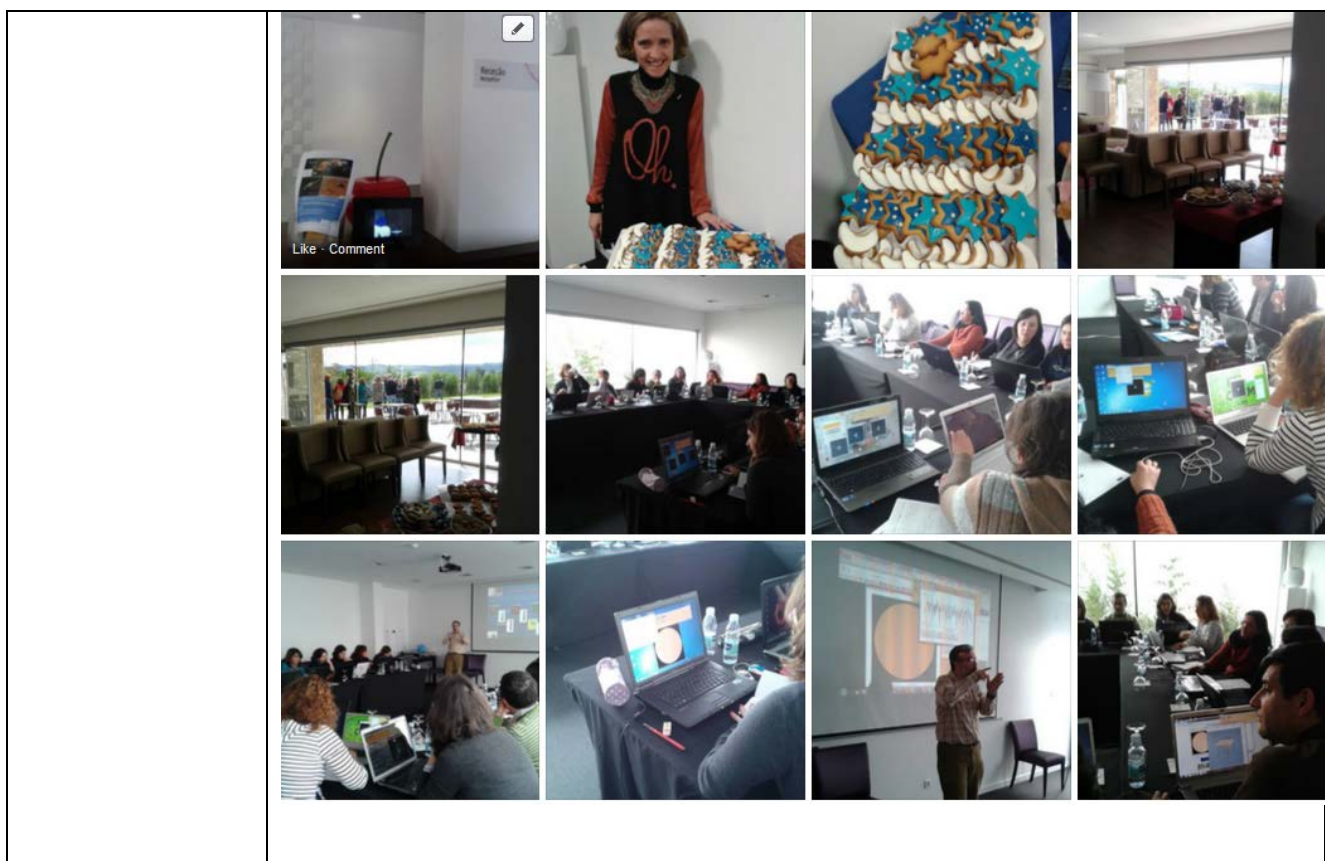
NUCLIO is the national coordinator of implementation in Portugal. During Phase-A it conducted 5 training workshops with 75 teachers from 17 secondary schools focusing on physics and astronomy curricula utilizing SalsaJ, Sun4all, and Faulkes remote telescopes (see list below). In the period prior and during Phase-A NUCLIO also organized series of demonstration events, so-called Go-Lab demos, in the framework of the Galileo Teachers Training Programme reaching a large audience of teachers and students. These events are facilitating the uptake of Go-Lab by science teachers and secondary schools in Portugal and beyond.


Date(s)	Type	Participants (Schools)	Labs	Subject(s)
07/01/2014	Training of teachers	20 (20)	Salsa J, Sun4all, Faulkes Telescope	Physics, Astronomy
21/03/2014	Training of teachers	20 (20)	Salsa J, Sun4all, Faulkes Telescope	Physics, Astronomy
04/05/2014	Training of teachers	30 (30)	Salsa J, Impact calculator	Physics, Astronomy
22/05/2014 – 30/06/2014	Training of teachers	5 (1)	Salsa J, Faulkes Telescope	Physics, Astronomy

In the following the reports from all the conducted activities are shown.

GO - LAB Report Code	PT19070114
Title	Astronomia Hands-on (Astronomy Hands-on)
Country City/Region	Portugal – Madeira Island
Working language	Portuguese
Start/End Date	07/01/2014 – 14/01/2014
Partners Involved	NUCLIO
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
Total number of teachers/schools	20 participants (Mathematics, Natural Sciences and Physics)
Activity Description	This is a certified training promoting the use of modern tools and resources for science education. Several Go-lab tools are presented. An entire section is devoted to IBSE.
Implemented online labs	Salsa J, Sun4all, Faulkes Telescope. Other virtual labs are also presented (Stellarium, Celestia, Google Earth and WWT)
Learning outcomes	The theme of big ideas was introduced and the tools and resources promoting them presented. The main purpose of this part of the training is to promote the interest of the teachers to collaborate between subject areas, grade levels and as far as possible using a contextualized approach
Photos or other relevant material	https://www.facebook.com/media/set/?set=a.796217353728614.1073741854.130639500286406&type=3

GO - LAB Report Code	PT19210314
Title	Astronomia Hands-on (Astronomy Hands-on)
Country City/Region	Portugal – Caldas da Rainha
Working language	Portuguese
Start/End Date	21/03/2014
Partners Involved	NUCLIO
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
Total number of teachers/schools	20 participants(Mathematics, Natural Sciences, Chemistry and Physics)
Activity Description	This is a certified training promoting the use of modern tools and resources for science education. An entire section is devoted to IBSE. The use of remote and virtual labs was introduced
Implemented online labs	Salsa J, Sun4all, Faulkes Telescope. Other virtual labs are also presented (Stellarium, Celestia, Google Earth and WWT)
Learning outcomes	The main goal was to overcome the barriers towards the uptake of modern tools for science education and the adoption of IBSE.
Photos or other relevant material	https://www.facebook.com/media/set/?set=a.881967808486901.1073741870.130639500286406&type=3



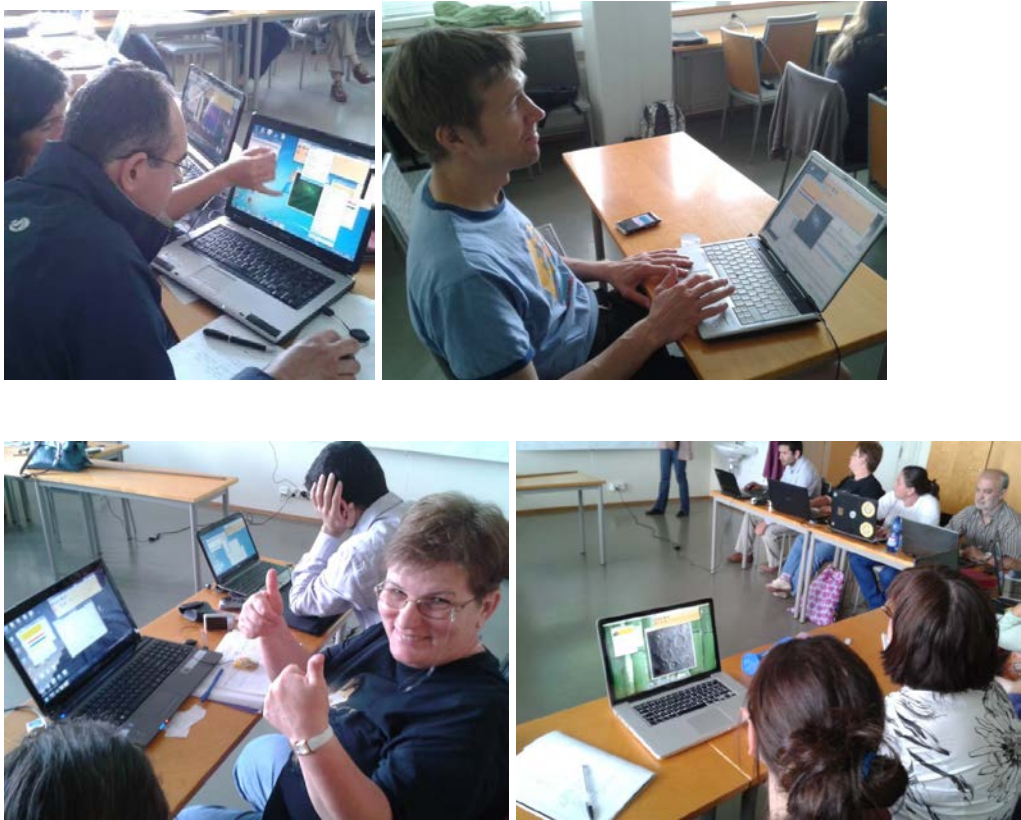
GO - LAB Report Code	PT19040514
Title	Go-lab pilot's day
Country City/Region	Portugal – Cascais
Working language	Portuguese
Start/End Date	4/5/2014
Partners Involved	NUCLIO
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
Total number of teachers/schools	30 participants(Mathematics, Natural Sciences, Chemistry and Physics)
Activity Description	National Go-lab event for pilot teachers with the participation of several Go-lab partners. The big ideas of science were discussed, some labs presented and a discussion around the use of IBSE promoted.
Implemented online labs	Impact Earth, Salsa J
Learning outcomes	
Photos or other relevant material	<p>https://www.facebook.com/media/set/?set=a.861911537159195.1073741867.130639500286406&type=3</p> 

GO - LAB Report Code	PT19220514
Title	Go-lab in Libraries Fun Corner
Country City/Region	Cascais - Portugal
Working language	Portuguese
Start/End Date	22/05/2014 – 30/06/2014
Partners Involved	NUCLIO
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
Total number of teachers/schools	5 library activity promoters
Activity Description	Training on the use of IBSE methodology and a selection of labs
Implemented online labs	Faulkes Telescope, Stellarium and Salsa J
Learning outcomes	This libraries promote afterschool activities to children in disadvantage areas. The idea is to sparkle their interest for science through the involvement of science experiences in the field of astronomy
Photos or other relevant material	

GO - LAB Report Code	PT19310714
Title	Go-lab Demos at School – NUCLIO on the road
Country City/Region	Portugal – Vila Real, Lisbon, Setubal, Porto, Oeiras, Cascais, Via Longa, PAlmela Vila Nova Barquinha, S.J.Madeira, Sesimbra,
Working language	Portuguese
Start/End Date	Jan 2014 – July 2014
Partners Involved	NUCLIO
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
Total number of teachers/schools	215 teachers and 2120 participants from middle and high school in 27 events
Activity Description	Demo activities in school where a modern topic of astronomy introduced, workshops for students on the use of digital tools and virtual labs and a workshop for teachers introducing the project.
Implemented online labs	Salsa J, Sun4all, Faulkes Telescope. Other virtual labs are also presented (Stellarium, Celestia, Google Earth and WWT)
Learning outcomes	The main goal was to overcome the barriers towards the uptake of modern tools for science education and the adoption of IBSE.
Photos or other relevant material	https://www.facebook.com/media/set/?set=a.790674720949544.1073741851.130639500286406&type=3 https://www.facebook.com/media/set/?set=a.772019979481685.1073741849.130639500286406&type=3 https://www.facebook.com/media/set/?set=a.799761340040882.1073741855.130639500286406&type=3 https://www.facebook.com/media/set/?set=a.805419019475114.1073741856.130639500286406&type=3 https://www.facebook.com/media/set/?set=a.881986631818352.1073741876.130639500286406&type=3 https://www.facebook.com/media/set/?set=a.848074618542887.1073741865.130639500286406&type=3 https://www.facebook.com/media/set/?set=a.843392572344425.1073741860.130639500286406&type=3 https://www.facebook.com/media/set/?set=a.843890355627980.1073741861.130639500286406&type=3 https://www.facebook.com/media/set/?set=a.845630122120670.1073741863.130639500286406&type=3 https://www.facebook.com/media/set/?set=a.878779498802807.1073741855.128063420541089&type=3 https://www.facebook.com/media/set/?set=a.889722831044732.1073741884.130639500286406&type=3




GO - LAB Report Code	PT19040513
Title	Universo Invisível (Invisible Universe)
Country City/Region	Portugal – Aveiro
Working language	Portuguese
Start/End Date	04-05-2013 / 08-06-2013
Partners Involved	NUCLIO
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
Total number of teachers/schools	20 participants (Mathematics, Natural Sciences and Physics)
Activity Description	This is a certified training promoting the use of modern tools and resources for science education introducing remote labs (radio antennas and robotic telescopes). Several Go-lab tools are presented. The methodology of IBSE was discussed and examples of the integration of its use with the tools were discussed.
Implemented online labs	Salsa J, Sun4all, Faulkes Telescope. Other virtual labs are also presented (radio antennas).
Learning outcomes	The main purpose this training was to promote the integration of remote and virtual labs in the classroom following curriculum guidelines.
Photos or other relevant material	http://nuclio.org/blog/o-universo-invisivel/

GO - LAB Report Code	PT19080713
Title	Astronomy@my PC
Country City/Region	Finland – Turku (Comenius Training)
Working language	English
Start/End Date	08/07/2013 – 12/07/2013
Partners Involved	NUCLIO
Coordinator name and email	Rosa Doran / rosa.doran@nuclo.pt
Total number of teachers/schools	15 participants teachers from different countries: Romania, Italy, Finland, Turkey, Slovenia, Portugal and Belgium
Activity Description	Activity promoted in the framework of Comenius Training Event
Implemented online labs	Salsa J, Sun4all, Faulkes Telescope. Other virtual labs are also presented (Stellarium, Celestia, Google Earth and WWT)
Photos or other relevant material	<p>http://nuclo.org/comenius/events/astronomymypc/</p> 



GO - LAB Report Code	PT19290713
Title	Astronomy@my PC and Astronomy@my Backpack
Country City/Region	Greece - Volos
Working language	English
Start/End Date	29/07/2013 – 02/08/2013
Partners Involved	NUCLIO / EA
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
Total number of teachers/schools	15 participants teachers from different countries: Portugal, Romenia, Poland, Belgium, Srilanka, USA
Activity Description	Activity promoted in the framework of Comenius Training Event and the Discover the Cosmos/ Global Hands-on Universe 2013
Implemented online labs	Salsa J, Sun4all, Faulkes Telescope. Other virtual labs are also presented (Stellarium, Celestia, Google Earth and WWT)
Learning outcomes	The theme of big ideas was briefly introduced
Photos or other relevant material	http://nuclio.org/comenius/events/astronomymypc-2/ https://www.facebook.com/media/set/?set=a.689733594376991.1073741837.130639500286406&type=3



GO - LAB Report Code	PT19161113
Title	Laboratórios Online para Astronomia (On-line labs for astronomy)
Country City/Region	Portugal – Vila Nova de Gaia
Working language	Portuguese
Start/End Date	16/11/2013
Partners Involved	NUCLIO
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
Total number of teachers/schools	13 participantes (Mathematics, Natural Sciences and Physics)
Activity Description	This is a certified training promoting the use of modern tools and resources for science education specially designed for Go-lab. Several Go-lab tools are presented. The Big Ideas were discussed, the construction of ILS and several other research based projects presented and discussed.
Implemented online labs	Salsa J, Sun4all, Faulkes Telescope. Other virtual labs are also presented (Stellarium, Celestia, Google Earth and WWT), Many cratered worlds.
Learning outcomes	The theme of big ideas was introduced and the tools and resources promoting them presented. The main purpose of this part of the training is to promote the interest of the teachers to collaborate between subject areas, grade levels and and as far as possible using a contextualized approach
Photos or other relevant material	<p>https://www.facebook.com/media/set/?set=a.881976475152701.1073741872.130639500286406&type=3</p> 



7.9 Spain

UDEUSTO is the national coordinator of implementation in Spain. It is also the lab provider/owner of remote labs such as Boole and Aquarium. During Phase-A it organised a national training workshop for science teachers with 49 participants. They practiced various virtual and remote labs including VISIR, Electricity, Boole, Methyl orange and associated ILSs for teaching physics, technology, chemistry etc.

GO - LAB Report Code	ES12-25062014
Title	Go-Lab Inquiry Learning Space: ILS for Technology and Physics
Country City/Region	Barcelona, Spain
Working language	Spanish
Start/End Date	25/06/14
Organizing Institute	University of Deusto; Cesire, Barcelona (http://www.xtec.cat/web/innovacio/cesire)
Coordinator name and email	Javier García-Zubía – zubia@deusto.es
Activity Form	Workshop
Activity Type	National activity
Total number of teachers/schools	49 teachers of secondary and high schools
Implemented online labs	Electricity Virtual Lab VISIR remote lab for analog electronics and physics Boole-Deusto experiments in frame of WebLab-Deusto remote lab for digital electronics and technology Archimedes; and Methyl orange
Brief description	Two weeks before the workshops, participated teachers got two examples of ILSs. One is already integrated on the Go-Lab Portal ("From the gate level to the digital circuit") and other one is in Word doc format ("Resistor Story"). The duration of the workshop was 3 hours. 53 teachers were enrolled and 49 participated in the workshop, around 35 provide the feedback over questionnaire. The workshop was divided in three parts: Description of the Go-Lab project: goals, web sites, contest and implementation.

	<p>Description of the ILS for analog electronics: how to connect resistors in series and in parallel. The teachers followed the ILS with real interaction with the VISIR remote lab. Description of the scaffolds: concept mapper, hypothesis scratchpad.</p> <p>Visiting golabz.eu and discovering new online labs.</p> <p>Discussion and reflection</p>
Learning outcomes	The goals of this workshop were to gather information about teachers' first impression of the Go-Lab platform, the use of on-line labs through the ILSs and the usefulness of guidance tools as a mean of support.
Website	<p>https://sites.google.com/a/xtec.cat/aulatec/home/ils_golab</p> <p>http://crpvalltenes.wordpress.com/2014/06/10/formacio-destiu-del-cesire-aulatec/</p>
Photos or other relevant material	 

	
Event agenda	<p>Session (25/06/2014)</p> <p>Programa (in Spanish)</p> <p>16:30 Presentació del projecte GoLab. http://www.go-lab-project.eu/</p> <p>16:45 Sessió amb ILS d'electrònica digital.</p> <p>17:15 Sessió amb ILS d'electrònica analògica i física.</p> <p>17:30 Estructura didàctica d'una ILS.</p> <p>17:45 Altres ILS i laboratoris de GoLab. http://www.golabz.eu</p> <p>18:00 Com participar amb èxit en el concurs GoLab. http://golab.ea.gr/contest2014/</p> <p>18:30 Recomanacions per al projecte GoLab.</p> <p>18:45 Com unir-se al projecte GoLab: avantatges per al professorat i el centre educatiu / Questionnaire</p>

7.10UK

UOG is the national coordinator of implementation in UK and provider of Faulkes Telescope remote lab. During Phase-A, school year 2013-2014, the educational community in UK were in a state of disturbance and dissatisfaction due to governmental reforms. As a consequence science teachers and schools in general were not motivated in participating in extra-curricular or other in-school activities outside their regular schedules. UOG devoted significant effort participating and contributing in activities organised by other partners focusing on physics and astronomy. In collaboration with ESA they conducted training for 30 science teachers from around Europe where the use of online labs was introduced and practiced (see first report below). UOG also attended and participated actively in various science and technology related events in the UK addressed to educational communities, stakeholders and public.

All reports of UOG's activities are included below.

GO - LAB Report Code	UK17-21/07/2014
Title	ESTEC ESA Summer Teacher Training Workshop
Country/City/Region	ESTEC, Netherlands
Working language	English
Start/End Date	21-25/07/2014
Organizing Institute	ESA
Coordinator name and email	Rebecca Barnes sciedu@esa.int
Activity description	Workshop
Activity Type	International
Total number of teachers and schools	30
Implemented online labs	Faulkes Telescope, SalsaJ, Craters etc
Brief description	An ESA organised summer workshop for secondary school teachers of STEM subjects. Participants were presented with innovative ways in which space and astronomy can be used to teach STEM. Participants were informed about ESA Education activities and resources, as well as current ESA missions, such as, Rosetta and the Automated Transfer Vehicle (ATV) which transports cargo to the International Space Station.
Website	http://www.esa.int/Education/Teachers_Corner/ESA_Summer_Workshop_for_Teachers_2014

GO - LAB Report Code	UK17-11/01/14
Title	Stargazing Live
Country/City/Region	UK Nationwide
Working language	English
Start/End Date	07/01/2014 – 11/01/2014
Organizing Institute	BBC
Coordinator name and email	UOG
Activity description	Public event at National Museum, Cardiff
Activity Type	A local event as part of a series of national events
Total number of teachers and schools	Approx 1000 members of public
Implemented online labs	Faulkes Telescope, SalsaJ, Craters etc
Brief description	Staff (including Paul Roche and Fraser Lewis) and students of USW attended a stand as part of this astronomy-themed day-long public event.
Website	http://www.bbc.co.uk/programmes/articles/5TdSYVZCzSp1JDVCXgfdpVq/events-2014

GO - LAB Report Code	UK17-25/02/14
Title	Inspiring Young People with Science - Telescopes for Schools
Country/City/Region	House of Commons, London
Working language	English
Start/End Date	25/02/2014
Organizing Institute	Science and Technology Facilities Council (STFC)
Coordinator name and email	UOG
Activity description	An event designed to showcase the work being done by robotic telescope facilities and the students/schools that use them
Activity Type	National
Total number of teachers and schools	200 people including MPs, industry representatives and teachers and pupils from ~5 schools
Implemented online labs	Faulkes Telescope, SalsaJ, Craters etc
Brief description	<p>This event brought together representatives from the Faulkes Telescope Project, the Liverpool Telescope and the Bradford Robotic Telescope to celebrate their achievements in STEM-related subjects. It was held at the House of Commons and included members of both Houses of Parliament, as well as various education bodies such as the exam boards. Attended by Fraser Lewis on behalf of Faulkes Telescope Project.</p> <p>It also allowed pupils to present their work to this audience.</p>
Website	

GO - LAB Report Code	UK17-14/04/14
Title	Go-Lab/GTTP Teacher Training
Country/City/Region	Enschede, Netherlands
Working language	English
Start/End Date	14-15/04/2014
Organizing Institute	Nuclio, University of Twente
Coordinator name and email	Rosa Doran (Nuclio) rosa.doran@gmail.com
Activity description	Workshop
Activity Type	International
Total number of teachers and schools	15 teachers
Implemented online labs	Faulkes Telescope, SalsaJ, Craters etc
Brief description	<p>My involvement (Fraser Lewis) was to present information and a series of IBSE scenarios around the topic of black holes – these activities are currently being developed by rosa and myself and will be integrated into Go-Lab soon.</p> <p>The event also features several workshop activities delivered by Rosa Doran and a Skype link-up with Eleftheria Tsourlidaki.</p>
Website	http://nuclio.org/comenius/events/astronomy-online-labs-for-inquiry-minds/

GO - LAB Report Code	UK17-02/05/14
Title	Go-Lab/GTTP Teacher Training
Country/City/Region	Estoril, Portugal
Working language	English
Start/End Date	02-05/05/2014
Organizing Institute	Nuclio
Coordinator name and email	Rosa Doran (Nuclio) rosa.doran@gmail.com
Activity description	Workshop
Activity Type	International
Total number of teachers and schools	15 teachers
Implemented online labs	Faulkes Telescope, SalsaJ, Craters etc
Brief description	My involvement (Fraser Lewis) was to present information and a series of IBSE scenarios around the topic of asteroids, comets and impacts – some of these activities are already integrated into Go-Lab and others will be available soon.
Website	http://www.galileoteachers.org/

GO - LAB Report Code	UK17-23/06/14
Title	Royal Astronomical Society (RAS), National Astronomy Meeting (NAM), Portsmouth
Country/City/Region	International event
Working language	English
Start/End Date	23/06/2014
Organizing Institute	Royal Astronomical Society (RAS)
Coordinator name and email	UOG
Activity description	Conference
Activity Type	Talk entitled “Bringing Astronomy Research into the Classroom “ in the Education and Public Outreach session.
Total number of teachers and schools	40 people – combination of research, outreach and teachers
Implemented online labs	Faulkes Telescope, SalsaJ, Craters etc
Brief description	Presented by Fraser Lewis, this was a 15 minute talk on the development of IBSE resources using real astronomical research data.
Website	https://www.ras.org.uk/events-and-meetings/ras-meetings/nam2014

GO - LAB Report Code	UK17-14/05/14
Title	CEMAS Mobile Apps and Education
Country/City/Region	Liberty Stadium, Swansea
Working language	English
Start/End Date	14/05/2014
Organizing Institute	CEMAS
Coordinator name and email	cemasevents@southwales.ac.uk
Activity description	Workshop
Activity Type	National
Total number of teachers and schools	60 people
Implemented online labs	Impact Calculator
Brief description	<p>This event aimed to stimulate Welsh businesses to develop apps for educational purposes, and raise awareness of the existence of such apps and how they are having a huge impact on teaching and learning.</p> <p>FT resources based around the Impact Calculator (developed with Go-Lab partner ESA) were demonstrated by Paul Roche.</p>
Website	http://www.liberty-stadium.com/events_venue_events_view.php?id=53

GO - LAB Report Code	UK17-01/07/14
Title	Royal Society Summer Exhibition
Country/City/Region	London
Working language	English
Start/End Date	30/6-4/7/14
Organizing Institute	The Royal Society
Coordinator name and email	UOG
Activity description	Exhibition
Activity Type	National Exhibition for Schools
Total number of teachers and schools	~ 1000
Implemented online labs	Faulkes Telescope, SalsaJ, Craters etc
Brief description	In conjunction with members of the ESA Gaia mission team, Paul Roche and Fraser Lewis attended this week-long exhibition on 2 separate days to display FT/Go-Lab/Gaia resources. ESA is also a member of Go-Lab and the Gaia mission is one that we intend to produce further resources upon.
Website	gaia.ac.uk http://sse.royalsociety.org/2014

7.11 Switzerland

CERN conducted and coordinated the implementation activities in Switzerland. As already mentioned in other sections of the document, CERN has a European/International status rather than a national one and so its target audience, in terms of teachers and pilot schools, are coming from European countries in general and not only from the partner's host country. In this context it organized training activities for science teachers in the framework of its established High-school Teachers Training summer programme. The trainings comprised hands-on workshops with labs such as Cernland, LHCgame, Hypatia, Minerva, with a focus on particle physics research. In collaboration with partners EA and IASA teachers from Greece are supported further to implement them in their schools upon return.

GO - LAB Report Code	CH15-12/08/2014
Title	HST2014, High-school Teachers Training Programme
Country/City/Region	Switzerland, CERN, Geneva
Working language	English
Start/End Date	12/8-15/8/2014
Organizing Institute	CERN
Coordinator name and email	Angelos Alexopoulos
Activity description	Teacher Training
Activity Type	International
Total number of teachers and schools	38
Implemented online labs	Cernland, LHCgame, Hypatia, Minerva
Brief description	Introduced participants into methodologies, tools and activities through which Physics, Particle Physics and CERN may be introduced effectively into the school classroom and school lab. The Go-Lab Project, the Go-Lab Portal and its associated Physics Labs (e.g. HYPATIA) were presented to the participants. Dissemination material (e.g. leaflets and brochures) were also distributed to the participants.
Website	Programme available at https://indico.cern.ch/event/331514/other-view?view=standard

Photos

8 Summary of results

Implementation Phase-A covered the period from project month 16 to month 21, which corresponds to 1 Feb 2014 – 31 Jul 2014. During that 6-month period partners organized and conducted 35 implementation activities around the host countries. Of which, 17 were activities with students (with 560 participants) and 18 training of teachers (with 380 participants). In total 381 secondary schools were involved in these activities (344 schools in teacher trainings and 37 in in-classroom activities with students). The full list of activities is tabulated below. Graphs 1 and 2 depict the distribution of number of participants in teacher trainings and activities with students, respectively, per partner host country. Graphs 3, 4 and 5 show the corresponding distributions in terms of number of schools involved.

The partners' focus for Phase-A was primary on offering and conducting comprehensive training for teachers covering the pedagogical and technical aspects of the Go-Lab approach. In this way they laid the foundations for successful implementation in Phase-B (which starts in project month 25 and lasts until month 33, 1 Nov 2014 – 31 Jul 2014) when an upgraded release of the system will be available (with updated and enriched repository of labs and authoring environment). The numbers reported herein are well exceeding the target set in DoW [1], i.e. implementation in 100 schools, and was necessary to be accommodated in order to satisfy the overwhelming interest and demand by schools to participate in the project (see also D7.1 and D7.2 [6],[7]).

In Phase-A and in the majority of the reported events, activities involved the use of online labs standalone. In some cases there were implementations of existing or already developed Inquiry Learning Spaces with minimum authoring by teachers. The online labs that partners demonstrated and introduced to schools were the following (listed alphabetically per category):

Simulations/virtual labs: Cernland, Craters, Electricity lab, Fishbowl, Galaxy-crash, Geogebra, Impact calculator, LHCgame, Osmotic power, PhET, Radioactivity, Splash

Datasets: Hypatia, ESA-SOHO, iSpyCMS, Minerva, SalsaJ, Sun4all

Remote labs: Aquarium, Boole, Faulkes-Telescope, Methyl orange, VISIR

The activities were linked to various science curriculum domains and in particular to Physics, Astronomy, Technology, Biology, Ecology, Maths, and Chemistry. Their classification in terms of subject domain is shown in Graphs 6 and 7, for teacher trainings and activities with students, respectively. The grand majority is on Physics and Astronomy. This fact is explained by the expertise and experience of the partners involved, and the online labs available in the repository at the time. Since then the repository of labs has been updated and populated with more labs from a variety of subjects that will be utilized in Phase-B activities.

In conclusion, during the first phase of implementation partners organized series of training workshops for teachers and activities with students reaching a large number of schools across different countries. The science teachers that participated were in general very interested in the Go-Lab overall approach. The national coordinators and partners that organised or conducted these activities and closely interacted with the teachers and schools identified certain areas of concern or expectations of improvement that they expressed/recommended. Their general remarks are:

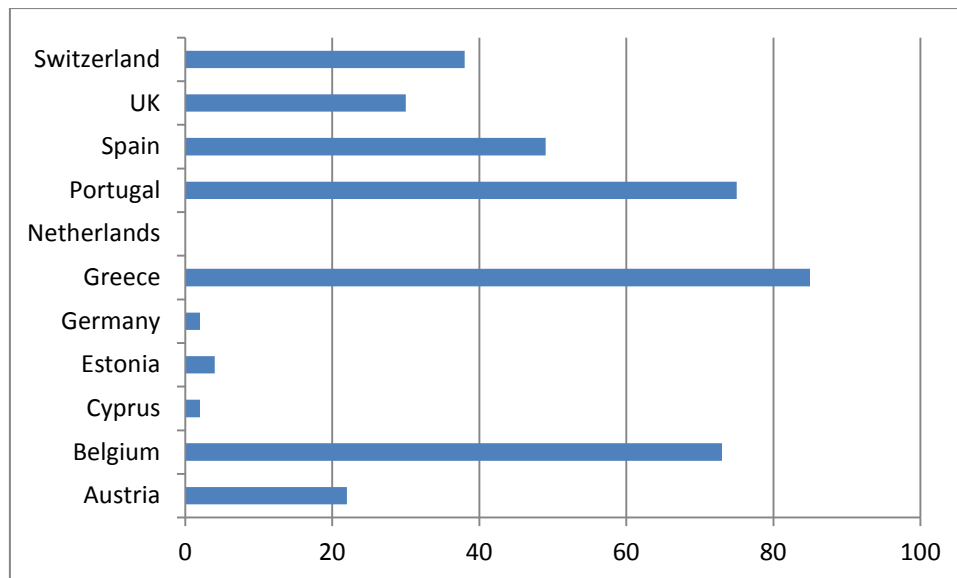
- Science teachers find that inquiry-based teaching is beneficial however it is difficult to implement due to time and curriculum constraints. They suggest that if shorter example ILSs are offered in the repository then their use in everyday classroom schedule will be facilitated.
- If labs and support applications/scaffolds can be available in the native language of students then their uptake will be easier.
- Given the large number of schools and teachers a community support/tutoring platform is needed for the subsequent implementation phases B and C.
- Teachers in general would like to have both an example at hand to follow and at the same time the flexibility to easily change, adapt and further develop it according to their specific needs, audience and experience. They are eager to practice the newer version of the system, which is expected to be released for project year 2, with the repository enriched with larger variety of labs and subject domains and accompanied by an authoring environment with upgraded functionality and user interface.

The next implementation Phase-B runs in the 9-month period from month 25, 1 Nov 2014 – 31 Jul 2014. During this phase the pilot schools will use the system more extensively and at 3 levels, namely, use the Go-Lab repository of labs for searching; implement existing Inquiry Learning Spaces developed by the project teams; develop new or adapt existing Inquiry Learning Spaces.

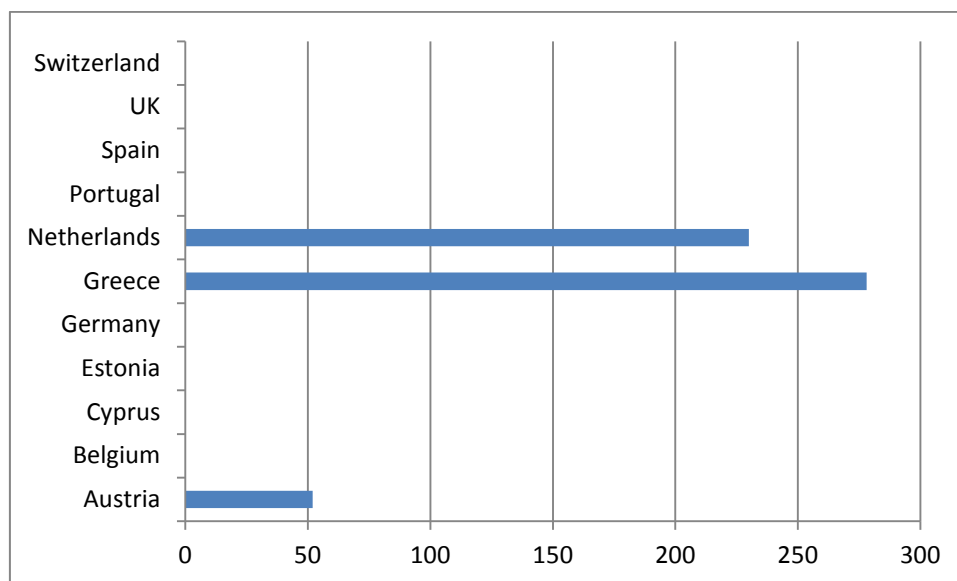
Country	Partner(s)	Date(s)	Type	Participants (Schools)	Labs	Subject(s)
Austria	CUAS	03/04/2014	Training of teachers	16 (10)	Radioactivity, VISIR	Physics, Technology
Austria	CUAS	03/04/2014	Activity with students	52 (4)	Radioactivity, VISIR	Physics, Technology
Austria	CUAS	07/07/2014	Training of teachers	6 (6)	Radioactivity	Physics
Belgium	EUN	15/02/2014	Training of teachers	15 (15)	Hypatia, Galaxy-crash	Physics, Astronomy
Belgium, France	EUN	02/03/2013	Training of teachers	28 (20)	Faulkes-Telescope, Aquarium, Hypatia, Sun4all, Cernland	Physics, Astronomy
Belgium, Spain	EUN	10/03/2013	Training of teachers	30 (22)	Faulkes-Telescope, Aquarium, Hypatia, Sun4all, Cernland	Physics, Astronomy
Cyprus	UCY		Training of teachers	2 (2)	Electricity lab	Physics
Estonia	UTE		Training of teachers	4 (2)	Biology labs, Fishbowl	Biology, Ecology
Germany	UDE		Training of teachers	2 (2)	Osmotic power	Chemistry, Ecology
Greece	EA	01/02/2014 – 31/03/2014	Activity with students	10 (1)	Splash, PhET	Physics
Greece	EA	10/02/2014	Activity with students	20 (1)	ESA-SOHO dataset, SalsaJ, Geogebra	Maths, Physics, Astronomy
Greece	EA	11/03/2014	Activity with students	28 (1)	iSpyCMS	Physics, Technology
Greece	EA	01/04/2014 – 07/05/2014	Activity with students	35 (7)	Splash, PhET	Physics
Greece	EA, IASA	29/04/2014	Training of teachers	22 (19)	Hypatia	Physics

Country	Partner(s)	Date(s)	Type	Partici- pants (Schools)	Labs	Subject(s)
Greece	EA, IASA	20/05/2014	Training of teachers	24 (20)	Hypatia	Physics
Greece	EA	09/05/2014	Activity with students	42 (1)	iSpyCMS	Physics, Technology
Greece	IASA	24/01/2014	Activity with students	28 (4)	Hypatia	Physics
Greece	IASA	19/02/2014	Activity with students	25 (4)	Hypatia	Physics
Greece	IASA	04/02/2014	Activity with students	45 (5)	Hypatia	Physics
Greece	IASA	10/03/2014	Activity with students	45 (5)	Hypatia	Physics
Greece	EA (organizer) and EPFL, UOG, NUCLIO, UTE, ULEIC	13/07/2014 -18/07/2014	Training of teachers	39 (38)	Faulkes Telescopes, Crashing Galaxies, SalsaJ, Craters, Electricity lab, Splash, HYPATIA	Physics, Technology, Biology, Ecology, Astronomy
Netherlands	UT	24/03/2014 25/03/2014	Activity with students	27 (1)	Splash	Physics
Netherlands	UT	14/04/2014 23/04/2014	Activity with students	90 (1)	Splash	Physics
Netherlands	UT	15/05/2014 28/05/2014	Activity with students	60 (1)	Splash	Physics
Netherlands	UT	23/06/2014 27/06/2014	Activity with students	53 (1)	Electricity lab	Physics
Portugal	NUCLIO	07/01/2014	Training of teachers	20 (20)	Salsa J, Sun4all, Faulkes Telescope	Physics, Astronomy
Portugal	NUCLIO	21/03/2014	Training of teachers	20 (20)	Salsa J, Sun4all, Faulkes Telescope	Physics, Astronomy
Portugal	NUCLIO	04/05/2014	Training of teachers	30 (30)	Salsa J, Impact calculator	Physics, Astronomy

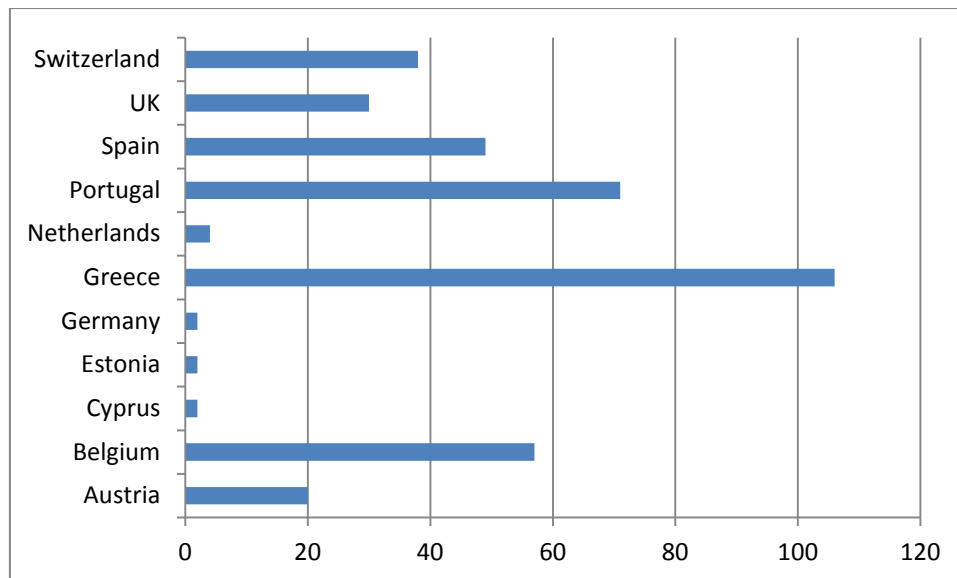
Country	Partner(s)	Date(s)	Type	Partici- pants (Schools)	Labs	Subject(s)
Portugal	NUCLIO	22/05/2014 – 30/06/2014	Training of teachers	5 (1)	Salsa J, Faulkes Telescope	Physics, Astronomy
Spain	UDEUSTO	25/06/2014	Training of teachers	49 (49)	Electricity lab, VISIR, Boole, Methyl orange	Physics, Technology, Chemistry
UK, Netherlands	UOG, ESA	21/07/2014 – 25/07/2014	Training of teachers	30 (30)	Faulkes Telescope, SalsaJ, Craters	Physics, Astronomy
Switzerland	CERN	12/08/2014 – 15/08/2014	Training of teachers	38 (38)	Cernland, LHCgame, Hypatia, Minerva	Physics



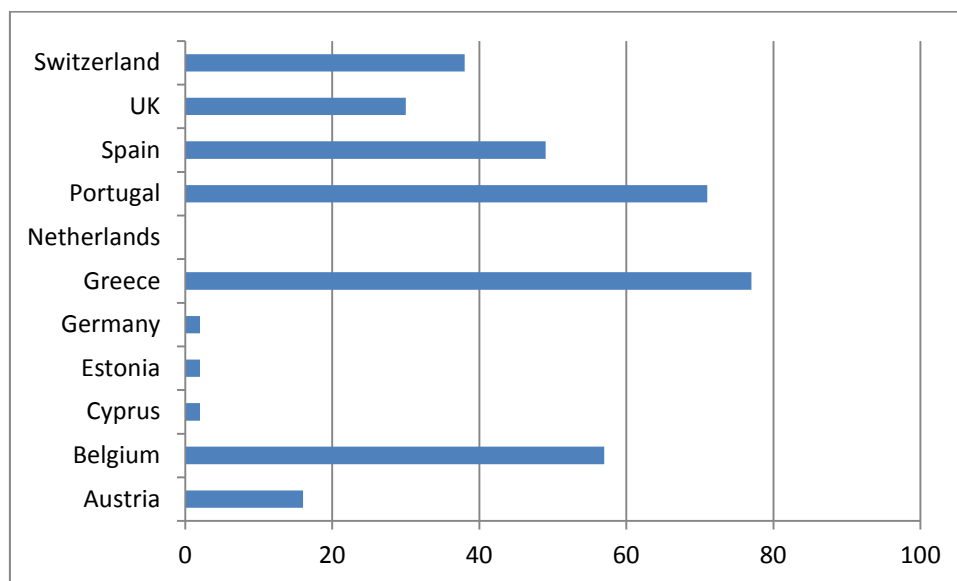
Graph 1. Number of participants in teacher trainings per partner host country



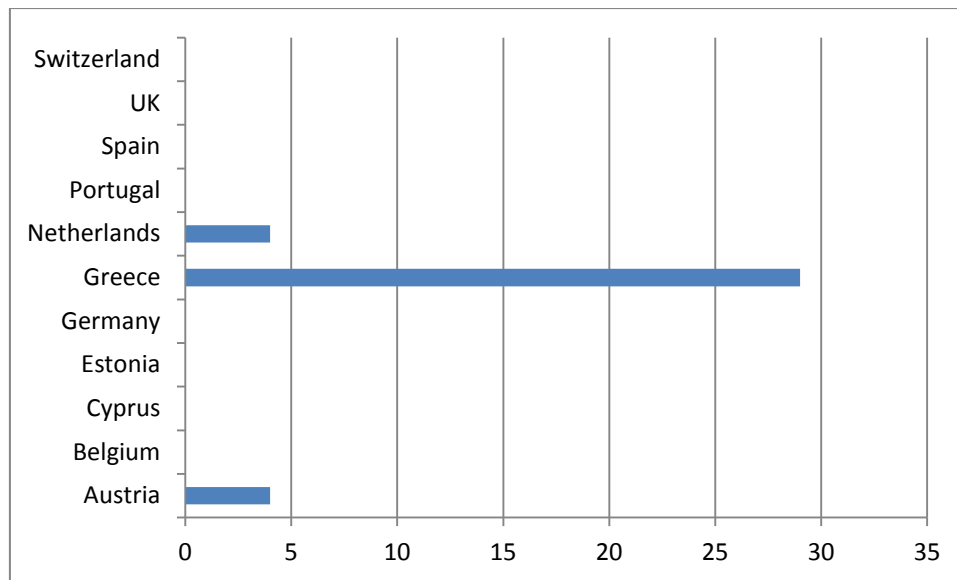
Graph 2. Number of participants in activities with students per partner host country



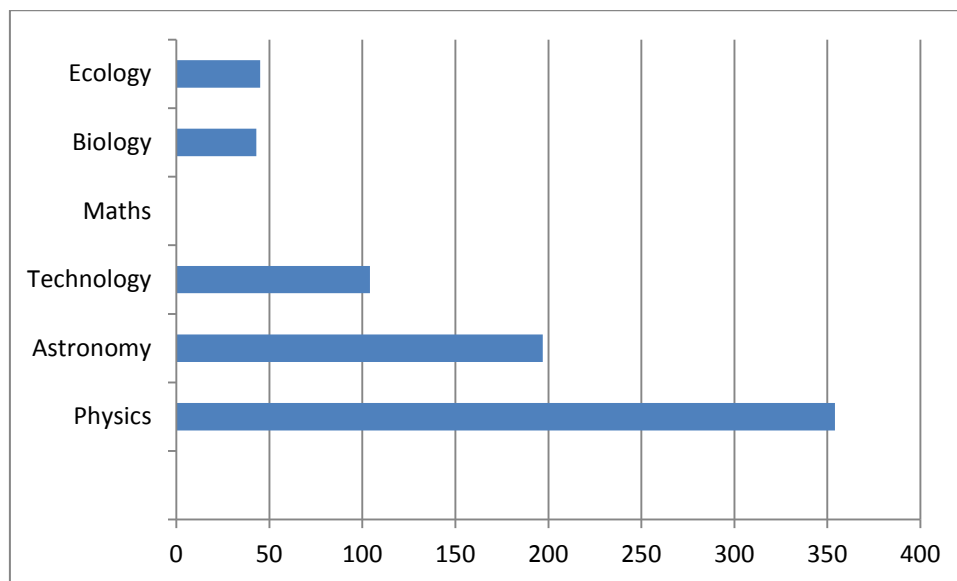
Graph 3. Number of schools involved in implementation activities (training of teachers or activities with students, or both) per partner host country



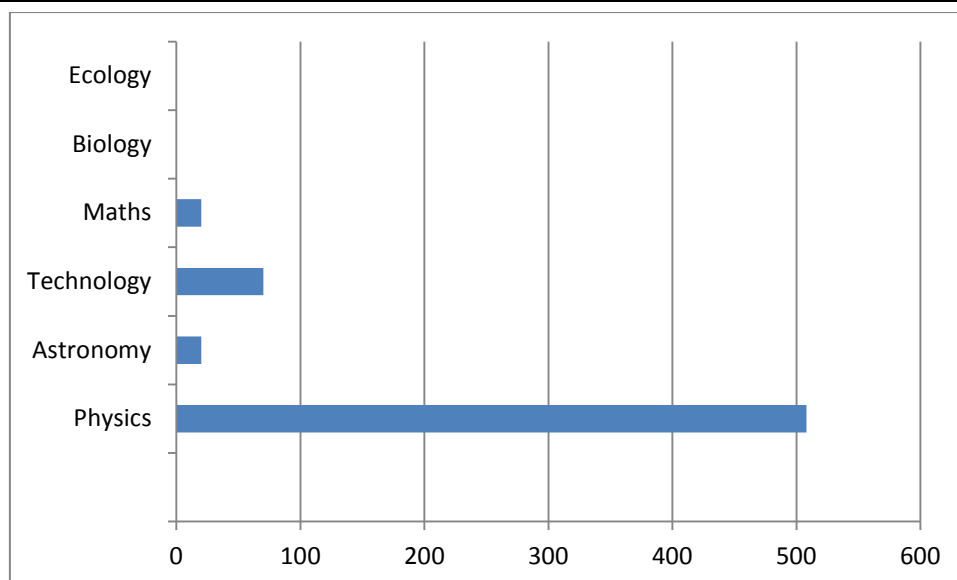
Graph 4. Number of schools involved in teacher trainings per partner host country



Graph 5. Number of schools involved in activities with students per partner host country



Graph 6. Number of participants in teacher trainings per subject domain



Graph 7. Number of participants in activities with students per subject domain

References

- [1] Go-Lab project Annex I – “Description of Work” version date 2012-09-19
- [2] G. Mavromanolakis, Large-scale pilots (Work package 7), Go-Lab Kick-off meeting, 19-20 Nov 2012, Twente, the Netherlands, http://graasp.epfl.ch/#item=asset_6607
- [3] Go-Lab Deliverable 6.1 “Specifications of Participatory Activities”, Month 3, Jan 2013
- [4] Go-Lab “Communities Cluster” meeting, 12-13 Feb 2013, Bologna, Italy. Agenda, minutes and presentations can be found at http://graasp.epfl.ch/#item=space_3213
- [5] Go-Lab Deliverable 6.4 “Report on the participatory engagement activities”, M24, Oct 2014
- [6] Go-Lab Deliverable 7.1 “Pilot Sample Profile – V1”, Month 18, Apr 2014
- [7] Go-Lab Deliverable 7.2 “Pilot Sample Profile – V2”, Month 24, Oct 2014

Appendix: Examples of event agendas

Summer School Programme

Day 1:

- Introduction and overview of the course
- Participants' presentation
- Keynote Talks
- *Lecture, 2 hours*

Day 2:

- Introduction to learning technologies, eLearning tools, remote labs and virtual experiments. Presentation of example technology-enhanced educational activities. – How teachers can benefit.
- *Lecture, 3 hours*
- Presentation of educational repositories and federations of on-line labs.
- *Workshop, 2 Hours*

Day 3:

- Introduction to the use of educational resources as well as virtual and remote labs for science education within the school environment.
- *Workshop, 2 Hours*
- Learning design practice: Using the on-line labs and design of inquiry learning scenarios-Part1
- *Workshop, 2 Hours*

Day 4:

- Learning design practice: Using the on-line labs and design of inquiry learning scenarios-Part2
- Practice reflection: Discussion on the organization of on-line labs, connection to the science curricula.
- *Workshop/Discussion, 3 hours*
- Presentation of the added value of educational metadata and the importance of adding educational objectives. Characterization of learning scenarios using educational Metadata.
- *Workshop, 2 hours*

Day 5:

- Refining and finalizing the inquiry scenarios based on comments by the trainers.
- *Workshop, 2 hours*
- Participatory Engagement Activity: Reading and commenting on fellow participants' inquiry scenarios and exchange of opinions among participants.
- Discussion on the added value of teachers' on-line communities.
- *Workshop, 2 hours*

Day 6:

- Presentations of the inquiry scenarios produced by the participants.
- *Lecture / Demonstration, 3 hours*
- Conclusions – Evaluation of the training course – Guidelines for follow-up activities
- *Lecture, 2 hours*

Agendas of short introductory and training events

Such events may be co-organized by partners with the local school counselor for a group of teachers from schools in the area. Also they may be accommodated within the framework of a conference or annual meeting of science teachers or similar event at national or regional level.

Example agenda of a 2h30m introductory event on Go-Lab.

Time	Session description
9:00 - 9:45	Introduction and welcome (5 min) Presentation of an educational scenario (e.g. on astronomy, physics or biology) by a science teacher using online labs
9:45 - 10:00	Discussion
10:00 - 10:15	Break
10:15 - 11:00	What Go-Lab offers (presentation of the pedagogical framework, objectives and the federation of labs and tools)
11:00 - 11:15	Discussion
11:15 - 11:30	Feedback collection, recruitment of interested teachers

Example agenda of a 2h30m training event/workshop on Go-Lab platform.

Time	Session description
9:00 - 9:45	Introduction and welcome (5 min) Presentation of an educational scenario (e.g. on astronomy, physics or biology) by a science teacher using the Go-Lab platform
9:45 - 10:00	Discussion
10:00 - 10:15	Break
10:15 - 11:00	Hands-on training on the Go-Lab platform
11:00 - 11:15	Discussion on user's requirements, difficulties, proposed improvements
11:15 - 11:30	Feedback collection

Agenda of a training workshop

Example agenda of a day long training workshop on Go-Lab platform and related educational scenarios.

	Time	Session description
Session 1	9:00 - 9:15	Introduction and welcome
	9:15 - 10:15	Presentation of educational scenario 1 (e.g. on astronomy, physics or biology) by a science teacher using the Go-Lab platform
	10:15 - 10:45	Discussion
	10:45 - 11:00	Break
	11:00 - 12:00	Presentation of educational scenario 2 (e.g. on astronomy, physics or biology) by a science teacher using the Go-Lab platform
	12:00 - 12:30	Discussion
	12:30 - 13:30	Lunch break
Session 2	13:30 - 15:00	Hands-on training on the Go-Lab platform
	15:00 - 15:15	Break
	15:15 - 16:15	Hands-on training on developing an educational scenario using the Go-Lab platform
	16:15 - 16:30	Discussion on user's requirements, difficulties, proposed improvements
	16:30 - 16:45	Feedback collection (questionnaires)