Go-Lab

Global Online Science Labs for Inquiry Learning at School

Collaborative Project in European Union's Seventh Framework Programme

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Report on Implementation Activities Phase-B

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The Go-Lab Consortium

Beneficiary Number	Beneficiary name	Beneficiary short name	Country
1	University Twente	UT	The Netherlands
2	Ellinogermaniki Agogi Scholi Panagea Savva AE	EA	Greece
3	École Polytechnique Fédérale de Lausanne	EPFL	Switzerland
4	EUN Partnership AISBL	EUN	Belgium
5	IMC AG	IMC	Germany
7	Universidad Nacional de Educación a Distancia	UNED	Spain
8	University of Leicester	ULEIC	United Kingdom
9	University of Cyprus	UCY	Cyprus
10	Universität Duisburg-Essen	UDE	Germany
11	Centre for Research and Technology Hellas	CERTH	Greece
12	Universidad de la Iglesia de Deusto	UDEUSTO	Spain
13	Fachhochschule Kärnten – Gemeinnützige Privatstiftung	CUAS	Austria
14	Tartu Ulikool	UTE	Estonia
15	European Organization for Nuclear Research	CERN	Switzerland
16	European Space Agency	ESA	France
17	University of South Wales	USW	United Kingdom
18	Institute of Accelerating Systems and Applications	IASA	Greece
19	Núcleo Interactivo de Astronomia	NUCLIO	Portugal
20	Cardiff University	CU	United Kingdom

Executive Summary

Implementation Phase-B covered the period from project month 25 to month 33, which corresponds to 1 Nov 2014 – 31 Jul 2015. During that 9-month period partners organized and conducted 80 implementation activities around the host countries. Of which, 35 were training workshops for teachers with 794 participants from 340 schools and 45 were activities with students with 1834 participants from 80 schools. The total summative results after Phase A and B are: 1184 teachers from 689 schools attended the training workshops that partners organized; 2394 students from 117 schools participated in the activities that partners organized.

The document herein first presents the implementation activities in each partner country reported for the Phase-B. It then concludes with the summary of results. This deliverable should be considered as a continuation of deliverable D7.3 “Report on Implementation Activities Phase-A”. In D7.3 various aspects of the implementation plan, such objectives and general strategy, role of national coordinators, distribution of schools etc., were presented in detail and will not be discussed here. To guide the reader only the topics of implementation activities and reporting are briefly repeated here in the following sections.

The full list of activities and associated reports are included in the document. Summative results are presented in tabulated format and in graphs where large variation on country per country level is observed. This still holds after taking into account the difference in allocated person-months per partner to conduct activities with schools, teachers and students. The variation of achieved results is because of several factors, among others the flexibility of the educational system in introducing innovative methods and practices, the ICT infrastructure in schools, the attitudes, skills and interests of teachers. The most crucial one is being the culture and attitude of teachers, and in general the education system as a whole, across different countries and how flexible or prone they are in adopting inquiry teaching and learning approaches, the use of online labs in science education etc. In this context in Greece, Spain, Portugal, Cyprus, Estonia, the Netherlands, better overall results are achieved compared to Austria, Germany, UK, Switzerland.

Furthermore we observe that in most countries and cases there is large expression of interest from schools and teachers to join the project and attend the trainings. However they then find difficult to fully apply what they learned in their everyday teaching practice. As a result the national coordinators and partners devoted significant effort to organize and conduct themselves in-school activities with students. Being in close collaboration and interaction with the teachers and their schools they identified certain areas of barriers in applying the Go-Lab approach. Their general findings are discussed in the document.

Regarding the online labs that partners demonstrated and introduced to schools, teachers and students during Phase B were from all three categories, simulations/virtual labs, datasets and remote labs. These were the following, listed alphabetically per category; Simulations/virtual labs: Bond, Build an atom, Electricity lab, Fishbowl Guppies, Gearsketch, Geogebra, Impact calculator, PhET-Buoyancy, PhET-Density, PhET-Balancing act, pH scale, Splash, Star in a box; Datasets: Hypatia, ESA-SOHO archives, iSpyCMS, Sun4all SalsaJ; Remote labs: Archimedes, Boole, Faulkes-Telescope, Radioactivity, VISIR.

The activities with teachers and students that practiced and utilized these online labs and related ILSs were linked to various science curriculum domains and in particular to Physics, Astronomy, Technology/Informatics/Electronics, Chemistry, Biology and Maths. Their classification in terms of subject domain is shown in Graphs 5 and 6, for teacher trainings and activities with students, respectively. The grand majority is on Physics (92% and 98%) and Astronomy (55% and 33%) followed by Technology/Electronics (31% and 10%), Chemistry (18% and 2%), Biology (8% and 12%) and Maths (6% and 2%). This fact is explained by the expertise and experience of the partners involved and also to some extent the schools' and teachers' preferences and demands.

In conclusion, during the second phase of implementation national coordinators and partners organized and conducted plethora of training workshops for teachers and activities with students reaching a large number of schools across different countries. The next 9-month implementation phase, Phase C, starts on project month 37, 1 Nov 2015. In that phase the total number of schools that will participate is expected to be doubled. Using the experience gathered during Phases B, and A, in order to be able to address the schools' needs of training of their teachers during Phase C partners will direct and focus their effort of support through online means, and less through onsite trainings and visits to schools. In this context a comprehensive collection of support materials that can be used for online and asynchronous self-trainings were organized and provided by a user support task force. These include video tutorials, guides of use, tips and frequently-asked-questions, recorded webinars, etc. They are online and currently available at http://www.golabz.eu/support. These will facilitate partners and teachers in the constant uptake of using online labs, ILSs and tools that Go-Lab offers and will sustain its usage during the last implementation phase of the project and beyond.

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, competiveness 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 presents the implementation activities in each partner country reported for the Phase-B, which covers the nine-month period from 1 Nov 2014 to 31 Jul 2015. It then concludes with the summary of results. This deliverable should be considered as a continuation of deliverable D7.3 "Report on Implementation Activities Phase-A" [1]. In D7.3 various aspects of the implementation plan, such objectives and general strategy, role of national coordinators, distribution of schools etc., were presented in detail and will not be discussed here. To guide the reader only the topics of implementation activities and reporting are briefly repeated here in the following sections.

2 Implementation Activities

The implementation of the Go-Lab project takes place in 3 phases covering 3 consecutive school years. 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 [2] and their activities were reported in D7.3 [1]. In Phase-B about 500 more schools were added in the network of pilot sites [3]. In Phase-C 500 more schools from the participating countries will join the network. Phase-A started in M16 (Feb.2014) and lasted 6 months, Phase-B started in M25 (Nov.2014) and lasted 9 months and Phase-C will start in M37 (Nov.2015) and will last 9 months. Before and during each phase various in-school implementation and community building 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 references [4], [5] and [6].

In general, an implementation activity intends to bring into the classroom practice the use of online labs and related resources in an innovative 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 for them to get familiarized with the relevant technology, gain knowledge and 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 pre-preparatory and support actions such as training workshops for teachers, both referred in the following as implementation activities, events or actions, are centrally coordinated by the Work Package 7 Leader. These activities are 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. 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.

For Phase-A national coordinators and partners offered and conducted comprehensive training for teachers covering the pedagogical and technical aspects of the Go-Lab approach. They also organized and conducted several activities where students participated. They continued the effort during Phase-B with a larger number of participating schools keeping a similar balance between teacher trainings and in-school activities with students. For each activity a report is issued, the full list of produced reports is included in this document is section 3.

3 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 project 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, and are e submitted at the end of each implementation phase.

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 1 and 2 that follow show the two separate forms/templates that are given to national coordinators and partners for reporting implementation activities, training events and workshops 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 feedback to and from the national coordinators and the partners involved in the organization and implementation of educational activities. The reports and results are regularly updated and discussed during online meetings within work-package 7 or other related ones, and also during the consortium meetings. In this way it is guaranteed on one hand an open and constructive exchange of experiences, best practices and difficulties faced and on the other a synchronization of effort among partners.

Table 1: Report template for training activities with teachers

G O - L A B Event Code	*[LLXX-DDMMYYYY] Please follow this format: LL= 2 letter country code, XX = partner id, DDMMYYYY = date*
Title	
Country City/Region	
Working language	
Start/End Date	*Please use this format DD/MM/YYYY*
Organizing Institute	
Coordinator name and email	
Activity Form	*[Workshop, Seminar, Conference, Summer School, in-school activity, etc]*
Activity Type	*[Local, National, International]* *Local activities: Demonstration & training in schools or in teachers training centers, workshops/seminars at regional level, etc.* *National activities: National Conferences and Workshops, or Contests for students and teachers, etc.*
Total number of teachers/schools	*Provide the number, or an estimate, of participants.*
Implemented online labs	
Brief description	*Write one or two paragraphs describing in brief the activity (subject, objectives, target audience etc)*
Learning outcomes	*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)*
Website	*(if applicable) The URL of the website that has been set up for this activity.*
Photos or other relevant material	*Select 3-4 good-quality photos or other relevant material (flyer, brochure, poster) and attach them in this report*
Event agenda	*(if applicable) Please copy here the agenda of the event (program of activities, etc.).*

Table 2: Report template for implementation activities with students

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

4 Reports for Implementation Phase-B

During the nine-month period of Phase-B national coordinators and partners offered and conducted comprehensive training for teachers covering the pedagogical and technical aspects of the Go-Lab approach. They also organized and conducted several activities where students participated. Overall a good balance between teacher trainings and in-school activities with students was achieved in line with expectations. In the following the full list of detailed reports per partner country are presented. The summary of results and observations are discussed in the next session.

4.1 Austria

CUAS conducted and coordinated 3 implementation activities with students from 5 secondary schools in Austria with about 80 participants. The Radioactivity, Electricity, Splash and VISIR labs and related ILSs were introduced and practiced. The subject domains of these activities and labs focused on physics and technology/informatics.

Date(s)	Activity type	Participants (Schools)	Labs	Subject(s)
12/03/2015	Activity with students	30 (3)	Radioactivity, Splash, electricity lab, pH scale	Physics, Technology
28/05/2015	Activity with students	25 (1)	VISIR	Informatics, Technology
28/05/2015	Activity with students	25 (1)	Radioactivity	Physics, Informatics

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

G O - L A B Report Code	[AT13-120315]
Title	Future job [campus] Speed Dating
Country City/Region	Villach
Working language	English, German
Start/End Date	10:30 – 13:00 12/03/2015
Partners Involved	Secondary schools from Villach, AMS,AK, Beruf- und Bildungs- orientierung Kärnten
Coordinator name and email	Ramona Oros R.Oros@fh-kaernten.at
School Profile	Technical school with bilingual teaching programs and profiles like mathematics, physics, chemistry, biology and informatics
Number and age of students	30 pupils from 3 secondary school, 10 - 14 years old
Activity Description	The main goal was to show students what learning with online and remote labs means. The activities were organized in 6 groups of pupils. During 15 minutes small groups of 3 – 6 pupils attended short presentation about online labs and after that they had the chance to try them. The objective was not to force pupils to use certain labs, more to let the curios ones to try first and motivate the others. In general half of the members of one group worked with at least one lab. Not all students feel confident in trying something new for the first time. The general impression was a positive. Pupils were attracted by the design of the labs. They came with suggestions of possible subjects and interest in using the labs for self-study.
Implemented online labs	Used labs: - Radioactivity - Splash - How are the light fixtures in a house connected? - Electricity (DE) - pH Scale
Learning outcomes	Pupils' reaction was positive on the possibility of using online and remote labs at school. Their interest was oriented on how they can access online labs and use them in reports of self-assessment activities. Using online tools in learning was attractive for them.

Photos or other relevant material	  

G O - L A B Report Code	AT13-28052015
Title	Implementation activity with secondary level students and teachers
Country City/Region	Austria
Working language	English
Start/End Date	28/05/2015
Partners Involved	Carinthia University of Applied Sciences
Coordinator name and email	Danilo Zutin (d.garbizutin@fh-kaernten.at) Christian Kreiter (c.kreiter@fh-kaernten.at)
School Profile	Technical, IT
Number and age of students	Approx. 25 students, age 16-18
Activity Description	The implementation activity took place in the facilities of HTL Moessingerstraße. Participants were students and two teachers from HTL Moessingerstraße. The implementation activity was a hands-on session for students to learn how to use an ILS on the example of the VISIR Remote Lab (Physics, Electronics). Therefore an ILS for VISIR was created prior to the session with the aim to also address students with a non-electronic background.
Implemented online labs	VISIR
Learning outcomes	Students have learnt how to make basic circuitry with the help of the graphical user interface of the VISIR client and to validate the results of their measurements through calculation. Further they saw an example of how to implement Online Labs and ILSs in their schedule to enrich their lessons, since it was the first time they used an ILS.

Photos or other relevant material	   

G O - L A B Report Code	AT13-28052015
Title	Radioactivity Lab - Implementation activity with secondary level students and teachers
Country City/Region	Austria, Villach
Working language	English
Start/End Date	28/05/2015
Partners Involved	Carinthia University of Applied Sciences
Coordinator name and email	Danilo Zutin (d.garbizutin@fh-kaernten.at) Christian Kreiter (c.kreiter@fh-kaernten.at)
School Profile	Informatics
Number and age of students	25 students, age 16-18
Activity Description	25 students from Colegiul National de Informatica „Grigore Moisil", Brasov, Romania participated in this implementation activity. It took place in a computer room at the Carinthia University of Applied Sciences in Villach, Austria. The students used the ILS "Is Radioactivity always harmful for humans?" together with the Radioactivity Remote Lab. The implementation activity was a hands-on session for students to learn how to use an ILS on the example of the Radioactivity Lab (Physics). The goal was to let students question the harmfulness of radioactivity on one side and the usefulness and practical applications on the other side.
Implemented online labs	Radioactivity Lab
Learning outcomes	Students have learnt about harmfulness as well as practical applications of radioactivity. They learnt that time and distance are crucial variables when it comes to radioactive exposure. Further, they learnt about the types of radiation (alpha, beta, gamma) and what kind of absorbers are necessary so that radiation cannot pass through. The theory was then demonstrated with the remote lab with different absorbers on a radioactive Strontium-90 source and different absorbers. Apart from the radioactivity topic the students saw an example how Online Labs and ILSs could enrich their lessons through participation and hands-on experience.

Photos or other relevant material	   

4.2 Belgium

EUN conducted and coordinated the implementation activities in Belgium, and also in Italy, Poland and other countries through online means. They are listed in the table below. As EUN has a European status, rather than a national one, 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, one of which in collaboration with NUCLIO as a workshop in the Scientix annual conference. In total 85 participants/teachers joined the training workshops where a variety of labs were introduced and practiced. The subject domains of these activities and labs were focused mainly on physics/astronomy and chemistry.

Date(s)	**Activity type**	**Participants (Schools)**	**Labs**	**Subject(s)**
24/10/2014 - 26/10/2014	Training of teachers	45 (30)	SalsaJ, Sun4all, Faulkes-Telescope	Physics, Astronomy
10/12/2014	Training of teachers	16 (10)	pH scale	Chemistry
10/01/2015	Training of teachers	24 (15)	pH scale	Chemistry

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

G O - L A B Event Code	BE1924092014
Title	Golab – Scientix - Laboratórios Online para Astronomia
Country City/Region	Belgium
Working language	English
Start/End Date	24/10/2014 - 26/10/2014
Organizing Institute	NUCLIO, EUN
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
Activity Form	2nd Scientix Conference
Activity Type	Conference Workshop
Total number of teachers/schools	45 teachers from 30 schools
Implemented online labs	Salsa J, Sun4all, Faulkes Telescope. Other virtual labs are also presented (Stellarium, Celestia, Google Earth and WWT)
Brief description	Online lab Faulkes Telescope offers a database of astronomical pictures as well as the opportunity for the students to remotely operate the telescope and to take their own pictures of the cosmos. Using image editing software the images collected by the students in the remotely operated telescope may be printed on a swelling paper (a special type of paper that allows its inked areas to swell when heated) and then printed on a thermal printer. This allows visually impaired students to be able to perceive the objects being observed in real time alongside their classroom companions.
Learning outcomes	With this workshop we plan to present a step by step guide to the participant teachers on how to conduct an in-class implementation of such activity in a joint and enriching experience, allowing visually impaired students to access these online personalised scientific experiments alongside their classmates.

G O - L A B Event Code	[BEEUN-10122014]
Title	Go-Lab Inquiry Learning at Schools
Country City/Region	online
Working language	English
Start/End Date	10/12/2014
Organizing Institute	European Schoolnet
Coordinator name and email	Mathilde Bargoin Mathilde.bargoin@eun.org
Activity Form	Online workshop for Go-Lab Pilot teachers
Activity Type	Online workshop with Go-Lab Pilot teachers from Italy, Belgium and Poland.
Total number of teachers/schools	16 teachers from 10 schools
Implemented online labs	Ph scale (ILS)
Brief description	The aim of the workshop was to inform Go-Lab Pilot teachers about the latest development around Go-Lab, present them the updated Graasp, explain them the tasks they are expected to carry out and finally answers any possible questions/queries they might have. The session started with an introduction to the project, its aims and main outcomes. A walk through in the new Graasp with the help of the following ph scale ILs has also taken place. During the final part of the training, teachers had the opportunity to ask questions about the competition, the availability of laboratories and the upcoming trainings.
Learning outcomes	After following this workshop, teachers have learnt the following: - What are the main aims of Go-Lab - The variety of resources/activities they can use - The tasks they are expected to carry out - What is an ILS and how they can use it - Introduction to the new Graasp - Go-Lab competition and how they can participate

Website	n/a
Photos or other relevant material	Recording is available upon request
Event agenda	➢ What is Go-Lab? ➢ What are the activities? ▪ Example of Inquiry Learning Spaces (ILS) ▪ The new Graasp tool ▪ Questionnaires (why and when) ➢ Your questions

G O - L A B Event Code	[BEEUN-10012015]
Title	Go-Lab Inquiry Learning at Schools
Country City/Region	online
Working language	English
Start/End Date	10/01/2015
Organizing Institute	European Schoolnet
Coordinator name and email	Mathilde Bargoin Mathilde.bargoin@eun.org
Activity Form	Online workshop for Go-Lab Pilot teachers
Activity Type	Online workshop with Go-Lab Pilot teachers from Italy, Belgium, Poland and the International Group managed by European Schoolnet
Total number of teachers/schools	24 teachers from 15 schools
Implemented online labs	pH scale (ILS)
Brief description	The aim of the workshop was to inform Go-Lab Pilot teachers about the latest development around Go-Lab, present them the updated Graasp, explain them the tasks they are expected to carry out and finally answers any possible questions/queries they might have. The session started with an introduction to the project, its aims and main outcomes. A walk through in the new Graasp with the help of the following pH scale ILs has also taken place. During the final part of the training, teachers had the opportunity to ask questions about the competition, the availability of laboratories and the upcoming trainings.
Learning outcomes	After following this workshop, teachers have learnt the following: - What are the main aims of Go-Lab - The variety of resources/activities they can use - The tasks they are expected to carry out - What is an ILS and how they can use it - Introduction to the new Graasp - Go-Lab competition and how they can participate

Website	n/a
Photos or other relevant material	Recording and screenshots of the session are available upon request
Event agenda	➢ What is Go-Lab? ➢ What are the activities? ▪ Example of Inquiry Learning Spaces (ILS) ▪ The new Graasp tool ▪ Questionnaires (why and when) ▪ Promotional messages and Go-Lab Tutoring community ➢ Your questions

4.3 Cyprus

UCY conducted and coordinated 15 implementation activities in Cyprus which are listed in the following table. The UCY team offered to schools a good balance of onsite training and support for the educational activities with students. Four onsite training activities for science teachers were organized, with 64 participants, where a variety of labs and related ILSs were introduced and practiced. The subject domains of these activities and labs focused on physics and also on technology, chemistry, maths, biology. The UCY team also organized 11 in-school activities with students where in total 178 students from 9 schools attended them and used the developed ILSs.

Date(s)	Activity type	Participants (Schools)	Labs	Subject(s)
17/01/2015 24/01/2015	Training of teachers	32 (10)	Electricity lab, Splash, Guppies	Physics, Biology
21/01/2015	Training of teachers	12 (5)	Osmotic power, Bond, Electricity lab	Physics, Chemistry
11/02/2015	Training of teachers	20 (5)	Splash, Electricity lab, Area builder	Physics, Maths
12/02/2015	Activity with students	12 (1)	Electricity lab	Physics
12/02/2015	Activity with students	16 (1)	Electricity lab	Physics, Technology
11/03/2015 12/03/2015	Activity with students	35 (2)	Electricity lab	Physics
19/03/2015	Activity with students	23 (1)	Splash	Physics
02/04/2015	Activity with students	15 (1)	Electricity lab	Physics
23/04/2015	Activity with students	10 (1)	Electricity lab	Physics
08/06/2015 10/06/2015	Activity with students	41 (1)	Electricity lab	Physics
26/05/2015 28/05/2015	Activity with students	26 (1)	Electricity lab	Physics

G O - L A B Event Code	CY09-17012015 and 24012015
Title	The Go-Lab and the potential it offers for the use of online labs in Science teaching
Country City/Region	Cyprus, Nicosia
Working language	Greek
Start/End Date	17/01/2015 and 24/01/2015
Organizing Institute	University of Cyprus
Coordinator name and email	Zacharias Zacharia zach@ucy.ac.cy
Activity Form	Seminar – Workshop
Activity Type	Local activity: Demonstration and teacher training
Total number of teachers/schools	32 in-service teachers (primary and secondary education)
Implemented online labs	Demonstration of: Electrical circuit lab and “Series and parallel circuits” ILS (in Greek) Splash: Virtual Buoyancy Laboratory Sexual Selection in Guppies
Brief description	The main goal of the seminar was the training of the teachers who will participate in the large scale pilot studies of the Go-Lab project. In addition, at the end of the seminar the pilot teachers’ tasks were explained. Participants were primary and secondary school teachers and they were all in service. Specifically, 8 participants were primary teachers and another 24 were secondary teachers. During the first session of the seminar, teachers were introduced to the main tasks to be undertaken within the frame of the Go-Lab project and inquiry-based learning. Afterwards, they had the opportunity to become familiar with some of the labs which are available in the Go-Lab portal, and elaborate on how these labs could be included in an inquiry learning space. For that purpose, the Sexual Selection in Guppies, the Slash: Virtual Buoyancy Laboratory and the Electrical Circuit Lab were demonstrated. In the second session of the seminar, the teachers were able to explore the “Apps” space of the Go-Lab portal, in order to try some of them. In addition, they went through a manual guide on how to use the Graasp authoring tool for creating Inquiry Learning Spaces. Finally, the tasks of the pilot studies, which must be undertaken by the teachers, were explained.

Learning outcomes	After this training seminar, the teachers learned how to explore the Go-Lab portal and search for labs and apps. The most important task was the familiarization with the Graasp authoring tool. Most of the teachers expressed their enthusiasm about the features of the Graasp and they tried almost all options. Many of them expressed their willingness to create and use an Inquiry Learning Space in their classes. Some of them reported that they would need more training before they would use Graasp. Finally, participants were informed about their tasks as pilot teachers and the procedures they will be engaged in during their participation in the project.
Website	N/A
Photos or other relevant material	  

	
Event agenda	Session 1 10:00 – 11:15 • Short presentation about Go-Lab project and Inquiry learning • Demonstration of the Go-Lab portal 11:15 – 11:30 • Break 11:30 – 13:00 • Training on the use of the Graasp authoring tool • Explanation of pilot teachers' tasks

G O - L A B Event Code	CY09-21012015
Title	The Go-Lab and its potentials for the use of online labs in Science teaching
Country City/Region	Cyprus, Limassol
Working language	Greek
Start/End Date	21/01/2015
Organizing Institute	University of Cyprus
Coordinator name and email	Zacharias Zacharia zach@ucy.ac.cy
Activity Form	Seminar – Workshop
Activity Type	Local activity: Demonstration and workshop
Total number of teachers/schools	12 teachers from 5 schools
Implemented online labs	Demonstration of: Osmotic Power Lab Bond Lab Electrical circuit lab and “Series and parallel circuits” ILS (in Greek)
Brief description	The main purpose of the seminar was to introduce Go-Lab to the teachers of a public senior high school. The teachers who attended the seminar were six Physicists, four Chemists and two Biologists. During the first session of the seminar, teachers were introduced to the main tasks to be undertaken within the frame of the Go-Lab project and inquiry-based learning. Afterwards, they had the opportunity to become familiar with some of the labs which are available in the Go-Lab portal, and elaborate on how these labs could be included in an inquiry learning space. For that purpose, the Osmotic Power Lab, the Bond Lab and the Electrical Circuit Lab were demonstrated. In addition, the teachers had the opportunity to see an existing ILS (Series and parallel circuits). In the second session of the seminar, the teachers were able to explore the “Apps” space of the Go-Lab portal, in order to try some of them.
Learning outcomes	The goals of this seminar were to gather information about teachers’ first impression of the Go-Lab portal and the usefulness of apps. After this seminar, the teachers learned how to explore the Go-Lab portal and search for apps. Most of the teachers expressed their enthusiasm about the app repository. Some of them expressed the need for further training in order to learn how to create an ILS.
Website	N/A

Photos or other relevant material	   
Event agenda	Session 1 08:00 – 09:15 • Short presentation about Go-Lab project and Inquiry learning • Demonstration of the Go-Lab portal o Osmotic Power Lab o Bond Lab o Electrical Circuit Lab o Series and in parallel circuits 09:15 – 09:30 • Break 09:30 – 10:00 • Exploration of the app repository • Evaluation of the usefulness of the available apps

G O - L A B Event Code	CY09-11022015
Title	The Go-Lab and its potentials for the use of online labs in Science teaching
Country City/Region	Cyprus, Nicosia
Working language	Greek
Start/End Date	11/02/2015
Organizing Institute	University of Cyprus
Coordinator name and email	Zacharias Zacharia zach@ucy.ac.cy
Activity Form	Seminar
Activity Type	Local activity: Demonstration
Total number of teachers/schools	20 in-service primary teachers from 5 schools
Implemented online labs	Demonstration of: Splash: Virtual Buoyance Lad Electrical Circuit Lab Area Builder
Brief description	The main purpose of the seminar was to introduce Go-Lab to the teachers of a public primary school, after UCY had been invited there. During the seminar, teachers were introduced to the main tasks to be undertaken within the frame of the Go-Lab project, to inquiry-based learning and the inquiry cycle and to the Go-Lab portal. In addition, the Electrical Circuit Lab, the Splash Lab and the Area Builder were demonstrated. Furthermore, some apps were demonstrated and teachers had the opportunity to see an ILS example in Greek, in order to get a first impression of how a lesson can be presented.
Learning outcomes	After the seminar the teachers have been invited to join the Go-Lab teacher community and they were given contact information if they wished to have additional training on how to use the Go-Lab portal and the Graasp authoring tool. A teacher of the school is already a Go-Lab pilot teacher and motivates her colleagues to use the Go-Lab.
Website	N/A

Photos or other relevant material	  
Event agenda	N/A

G O - L A B Event Code	CY09-12022015
Title	ILS implementation: Series and parallel circuits (in Greek)
Country City/Region	Cyprus, Larnaca
Working language	Greek
Start/End Date	12/02/2015
Organizing Institute	University of Cyprus
Coordinator name and email	Zacharias Zacharia zach@ucy.ac.cy
Activity Form	In school activity
Activity Type	Implementation activity
School profile	Aradippou Lyceum is a public senior high school in Larnaca, Cyprus. “Λύκειο Αραδίππου”: http://lyk-aradippou-lar.schools.ac.cy/
Total number of teachers/schools	12 secondary students (16 years old, 11 boys and 1 girl)
Implemented online labs	Series and parallel circuits ILS (in Greek): http://graasp.eu/ils/54b644f551830bd46a666837?lang=el
Brief description	The main purpose of the “Series and parallel circuits” ILS implementation was the evaluation of the usability of Go-Lab apps included in the ILS (Hypothesis Tool, Experiment Design Tool, Observation Tool, Data Viewer Tool and Conclusion Tool). Students completed the ILS in two didactic hours (approximately 80 minutes). Because of some technical problems (e.g., slow loading, saving and retrieving data), another 10 minutes were given to students to complete their investigation. Before and after the intervention, students completed pre- and post-tests on student knowledge and inquiry skills. Data from pre- and post- tests were analyzed for experimental design study purposes.
Learning outcomes	Data analysis showed that students were able to use the tools in the ILS, despite the fact that they had encountered some important difficulties when undertaking learning activities. During the discussion at the end of the implementation, the majority of the students agreed that they had enjoyed the lesson and that using Go-Lab was a pleasure for them. In addition, some students suggested that they would be willing to use Go-Lab again in their future science lessons. In addition, it was expected that students improved their knowledge and inquiry skills.

Photos or other relevant material	  

G O - L A B Event Code	CY09-10032015
Title	ILS implementation: Series and parallel circuits (in Greek)
Country City/Region	Cyprus, Limassol
Working language	Greek
Start/End Date	10/03/2015
Organizing Institute	University of Cyprus
Coordinator name and email	Zacharias Zacharia zach@ucy.ac.cy
Activity Form	In school activity
Activity Type	Implementation activity
School profile	Limassol A Technical school is a public senior high school in Limassol, Cyprus. "Α Τεχνική Σχολή Λεμεσού": http://tech-scholi1-lem.schools.ac.cy/
Total number of teachers/schools	16 secondary students (16 years old, 15 boys and 1 girl)
Implemented online labs	Series and parallel circuits ILS (in Greek): http://graasp.eu/ils/54b644f551830bd46a666837?lang=el
Brief description	Students completed the ILS in two didactic hours (90 minutes). Before and after the intervention, they completed pre- and post-tests on student knowledge and inquiry skills. Data from pre and post tests were analyzed for experimental design study purposes.
Learning outcomes	Since the EDT had not been integrated in the ILS, students were expected to have difficulties when they would prepare their experiment design. In addition, these difficulties were expected to be reflected in student gains in terms of their knowledge and inquiry skills.

Photos or other relevant material	  

G O - L A B Event Code	CY09-11032015_12032015
Title	ILS implementation: Series and parallel circuits (in Greek)
Country City/Region	Cyprus, Nicosia
Working language	Greek
Start/End Date	1st intervention 11/03/2015 2nd intervention 12/03/2015
Organizing Institute	University of Cyprus
Coordinator name and email	Zacharias Zacharia zach@ucy.ac.cy
Activity Form	In school activity
Activity Type	Implementation activity
School profile	Gymnasium Dianellou and Theodotou is a public high school in Nicosia, Cyprus. “Γυμνάσιο Διανέλλου και Θεοδότου”: http://gym-dianellou-theodotou-lef.schools.ac.cy/
Total number of teachers/schools	1st intervention 17 secondary students (14 years old, no gender information) 2nd intervention 18 secondary students (14 years old, 9 boys and 9 girls)
Implemented online labs	Series and parallel circuits ILS: http://graasp.eu/ils/54b644f551830bd46a666837?lang=el
Brief description	The main purpose of the “Series and parallel circuits” ILS implementation was the evaluation of the impact of the EDT. Before and after the intervention, students completed pre- and post-tests on student knowledge and inquiry skills. Students completed the ILS in two didactic hours (approximately 80 minutes). The data from the pre- and post-tests were analyzed for experimental design study purposes. During the intervention, students encountered technical problems and some of them could not complete all the phases of the ILS.
Learning outcomes	Students were able to use the tools in the ILS (Hypothesis Scratchpad, EDT, Observation tool, Conclusion tool). However, because of the technical problems (e.g., slow loading and saving data), they expressed complaints and suggested that the lesson would be more interesting if it had fewer tools. However, students were expected to improve their knowledge and inquiry skills.

Photos or other relevant material	   

G O - L A B Event Code	CY09-19032015
Title	ILS implementation: Relative Density (adapted in Greek)
Country City/Region	Cyprus, Nicosia
Working language	Greek
Start/End Date	19/03/2015
Organizing Institute	University of Cyprus
Coordinator name and email	Zacharias Zacharia zach@ucy.ac.cy
Activity Form	In school activity
Activity Type	Implementation activity
School profile	Akaki Gymnasium is a rural public high school in Nicosia, Cyprus. “Γυμνάσιο Ακακίου”: http://gym-akaki-lef.schools.ac.cy/
Total number of teachers/schools	23 secondary students (14 years old, 10 boys and 13 girls)
Implemented online labs	Relative Density ILS (adapted in Greek): http://graasp.eu/ils/55068f84680bfb937acf36f5?lang=el
Brief description	Students completed the Relative Density ILS in two didactic hours (90 minutes). Before and after the intervention, they completed pre- and post-tests on student knowledge and inquiry skills. The data from the pre- and post-tests were analyzed for experimental design study purposes. Approximately half of the students used the EDT (experimental group), and the other half did not (control group).
Learning outcomes	Differences in knowledge and inquiry skills tests between the two groups were expected. Students in the experimental group were expected to score better in the post tests than students in the control group.

Photos or other relevant material	  

,G O - L A B Event Code	CY09-02042015
Title	ILS implementation: Series and parallel circuits (in Greek)
Country City/Region	Cyprus, Larnaca
Working language	Greek
Start/End Date	02/04/2015
Organizing Institute	University of Cyprus
Coordinator name and email	Zacharias Zacharia zach@ucy.ac.cy
Activity Form	In school activity
Activity Type	Implementation activity
School profile	Makariou C Lyceum is a public senior high school in Larnaca, Cyprus. “Λύκειο Μακαρίου Γ”: http://lyk-makarios-lar.schools.ac.cy/
Total number of teachers/schools	15 secondary students (16 years old, 4 boys and 11 girls)
Implemented online labs	Series and parallel circuits ILS (in Greek): http://graasp.eu/ils/54b644f551830bd46a666837?lang=el
Brief description	Students completed the “Series and parallel circuits” ILS in two didactic hours (90 minutes). Before and after the intervention, students completed pre- and post-tests on student knowledge and inquiry skills. The data from the pre- and post-tests were analyzed for experimental design study purposes.
Learning outcomes	Students completed all the activities in each phase and they didn’t encounter any problems during the use of the tools. They were expected to improve their knowledge and inquiry skills.

Photos or other relevant material	  

G O - L A B Event Code	CY09-23042015
Title	ILS implementation: How are the light fixtures in a house connected? (adapted in Greek)
Country City/Region	Cyprus, Nicosia
Working language	Greek
Start/End Date	23/04/2015
Organizing Institute	University of Cyprus
Coordinator name and email	Zacharias Zacharia zach@ucy.ac.cy
Activity Form	In school activity
Activity Type	Implementation activity
School profile	A Agios Dometios primary school is a public primary school in Nicosia, Cyprus. "Δημοτικό σχολείο Αγίου Δομετίου Α": https://dometiosadimkb.wordpress.com/
Total number of teachers/schools	10 primary students (11-12 years old, 3 boys and 7 girls)
Implemented online labs	How are the light fixtures in a house connected (adapted in Greek): http://graasp.eu/spaces/54be2181bc0c6f2fb1a31447
Brief description	Students completed the "How are the light fixtures in house connected" ILS in two didactic hours (80 minutes). Before and after the intervention, they completed pre- and post-tests on student knowledge and inquiry skills.
Learning outcomes	At the end of the intervention, students expressed their great enthusiasm about the ILS and the use of the virtual lab (Electrical circuit lab). They also said that they would have preferred working in a similar way, using ICT in the classroom, rather than attending a traditional classroom. In addition, they were expected to improve their knowledge and inquiry skills.

Photos or other relevant material	  

G O - L A B Event Code	CY09-08062015-10062015
Title	ILS implementation: How are the light fixtures in a house connected? (adapted in Greek)
Country City/Region	Cyprus, Larnaca
Working language	Greek
Start/End Date	1st intervention 08/06/2015 2nd intervention 10/06/2015
Organizing Institute	University of Cyprus
Coordinator name and email	Zacharias Zacharia zach@ucy.ac.cy
Activity Form	In school activity
Activity Type	Implementation activity
School profile	E Aradippou primary school is a public primary school in Larnaca, Cyprus. “Ε Δημοτικό σχολείο Αραδίππου”: http://dim-aradippou5-lar.schools.ac.cy/
Total number of teachers/schools	1st intervention 23 primary students (11-12 years old, 12 boys and 11 girls) 2nd intervention 18 primary students (11-12 years old, 9 boys and 9 girls)
Implemented online labs	How are the light fixtures in a house connected (adapted in Greek): http://graasp.eu/spaces/54be2181bc0c6f2fb1a31447
Brief description	Students completed the “How are the light fixtures in house connected” ILS in two didactic hours (80 minutes). Before and after the intervention, they completed pre- and post-tests on student knowledge and inquiry skills.
Learning outcomes	No technical problems were encountered, and, at the end of the intervention, students expressed their enthusiasm about the tools and the Electrical circuit lab. In addition, they were expected to improve their knowledge and inquiry skills.

Photos or other relevant material	  

G O - L A B Event Code	CY09-26052015-28052015
Title	ILS implementation: How are the light fixtures in a house connected? (adapted in Greek)
Country City/Region	Cyprus, Limassol
Working language	Greek
Start/End Date	1st intervention 26/05/2015 2nd intervention 28/05/2015
Organizing Institute	University of Cyprus
Coordinator name and email	Zacharias Zacharia zach@ucy.ac.cy
Activity Form	In school activity
Activity Type	Implementation activity
School profile	B Trachoni primary school is a public primary school in Limassol, Cyprus. “Β Δημοτικό σχολείο Τραχωνίου”: http://dim-trachoni2-lem.schools.ac.cy/
Total number of teachers/schools	1st intervention 14 primary students (11-12 years old, 5 boys and 9 girls) 2nd intervention 12 primary students (11-12 years old, 4 boys and 8 girls)
Implemented online labs	How are the light fixtures in a house connected (adapted in Greek): http://graasp.eu/spaces/54be2181bc0c6f2fb1a31447
Brief description	Students completed the “How are the light fixtures in house connected” ILS in two didactic hours (80 minutes). Before and after the intervention, they completed pre- and post-tests on student knowledge and inquiry skills.
Learning outcomes	Students were expected to improve their knowledge and inquiry skills. At the end of the intervention, they said that they had enjoyed learning activities and that they had liked the tools and the electrical circuit lab.

Photos or other relevant material	  

4.4 Estonia

UTE conducted and coordinated the implementation activities in Estonia that are listed in the following table. Four activities for science classrooms were organized, with 208 participant students, where the Splash and Guppies labs were introduced and practiced along with their accompanying ILSs which are translated in Estonian. The subject domains of these activities and labs focused on physics and biology.

Date(s)	Activity type	Participants (Schools)	Labs	Subject(s)
26/03/2015 15/04/2015	Activity with students	82 (1)	Splash, Guppies	Physics, Biology
31/03/2015 15/04/2015	Activity with students	76 (1)	Splash, Guppies	Physics, Biology
08/04/2015	Activity with students	26 (1)	Guppies	Biology
14/04/2015	Activity with students	24 (1)	Splash	Physics

43G O - L A B Report Code	EEUTE-260315
Title	Activity with students
Country City/Region	Estonia / Valga
Working language	Estonian
Start/End Date	1st intervention on 26/03/2015 (90 minutes) 2nd intervention on 15/04/2015 (90 minutes)
Partners Involved	UTE
Coordinator name and email	Mario Mäeots, mario.maeots@ut.ee
School Profile	Valga Põhikool (Valga Basic School) http://www.valgapk.edu.ee is a public basic school in Valga, Estonia.
Number and age of students	43 students in the first intervention and 39 students in the second intervention, age 14-15 years old
Activity Description	As part of science class lessons (physics and biology), basic school students went to the computer classroom to learn about science via the Go-Lab inquiry learning environment. **1st intervention:** Together with an instructor students were introduced to the Go-Lab Inquiry Learning Space *Kas on hea olla ilus? - Selgitame evolutsiooni läbi loodusliku ja sugulise valiku (Is it Good to be Beautiful? – Understanding evolution through natural and sexual selection*). In this example Inquiry Learning Space students became familiar with how various Go-Lab Apps work (e.g. Hypothesis scratchpad) and learnt the five-phase structure (Orientation, Conceptualisation, Investigation, Conclusion and Discussion) of inquiry. **2nd intervention:** Students independently worked through a Go-Lab Inquiry Learning Space *Plärts! (Splash)*. In this Inquiry Learning Space students had to formulate research questions, hypotheses, an experimental plan and make conclusions based on evidence collected from a virtual lab.
Implemented online labs	Kas on hea olla ilus? - Selgitame evolutsiooni läbi loodusliku ja sugulise valiku (Is it Good to be Beautiful? – Understanding evolution through natural and sexual selection) http://graasp.eu/ils/555c388658351538d11ecec0?lang=et Plärts! (Splash!) http://graasp.eu/ils/552cc1c3680bfb937acf42c0?lang=et
Learning outcomes	Students were expected to improve their inquiry skills such as stating hypotheses and research questions. It was also expected that they learn how to make valid conclusions based on the evidence collected in the virtual laboratory.

Photos or other relevant material	  

G O - L A B Report Code	EEUTE-310315
Title	Activity with students
Country City/Region	Estonia / Tartu
Working language	Estonian
Start/End Date	1st intervention on 31/03/2015 (90 minutes) 2nd intervention on 15/04/2015 (90 minutes)
Partners Involved	UTE
Coordinator name and email	Mario Mäeots, mario.maeots@ut.ee
School Profile	Tartu Variku Kool (Tartu Variku Basic School) http://www.variku.tartu.ee is a public basic school in Tartu, Estonia.
Number and age of students	39 students in the first intervention and 37 students in the second intervention, age 14-15 years old
Activity Description	As part of science class lessons (physics and biology), basic school students went to the computer classroom to learn about science via the Go-Lab inquiry learning environment. **1st intervention:** Together with an instructor students were introduced to the Go-Lab Inquiry Learning Space *Kas on hea olla ilus? - Selgitame evolutsiooni läbi loodusliku ja sugulise valiku (Is it Good to be Beautiful? – Understanding evolution through natural and sexual selection*). In this example Inquiry Learning Space students became familiar with how various Go-Lab Apps work (e.g. Hypothesis scratchpad) and learnt the five-phase structure (Orientation, Conceptualisation, Investigation, Conclusion and Discussion) of inquiry. **2nd intervention:** Students independently worked through a Go-Lab Inquiry Learning Space *Plärts! (Splash)*. In this Inquiry Learning Space students had to formulate research questions, hypotheses, an experimental plan and make conclusions based on evidence collected from a virtual lab.
Implemented online labs	Kas on hea olla ilus? - Selgitame evolutsiooni läbi loodusliku ja sugulise valiku (Is it Good to be Beautiful? – Understanding evolution through natural and sexual selection) http://graasp.eu/ils/555c388658351538d11ecec0?lang=et Plärts! (Splash!) http://graasp.eu/ils/552cc1c3680bfb937acf42c0?lang=et
Learning outcomes	Students were expected to improve their inquiry skills such as stating hypotheses and research questions. It was also expected that they learn how to make valid conclusions based on the evidence collected in the virtual laboratory.

Photos or other relevant material	  

G O - L A B Report Code	EEUTE-080415
Title	Activity with students
Country City/Region	Estonia / Tartu
Working language	Estonian
Start/End Date	08/04/2015 (75 minutes)
Partners Involved	UTE
Coordinator name and email	Mario Mäeots, mario.maeots@ut.ee
School Profile	Tartu Jaan Poska Gümnaasium (Tartu Jaan Poska Secondary School) www.jpg.tartu.ee is a public secondary school in Tartu, Estonia.
Number and age of students	26 students, age 18-19 years old
Activity Description	As part of a biology class lesson, secondary school students went to the computer lab and learnt about evolution by using the Go-Lab inquiry learning environment. Students were asked to independently complete the Inquiry Learning Space *Kas on hea olla ilus? - Selgitame evolutsiooni läbi loodusliku ja sugulise valiku* (*Is it Good to be Beautiful? – Understanding evolution through natural and sexual selection*). In this Inquiry Learning Space students had to formulate research questions, hypotheses, an experimental plan and make conclusions based on evidence collected from the virtual lab *Sexual Selection in Guppies*. Two researchers from the University of Tartu were involved in implementing this activity at the school.
Implemented online labs	Kas on hea olla ilus? - Selgitame evolutsiooni läbi loodusliku ja sugulise valiku (Is it Good to be Beautiful? – Understanding evolution through natural and sexual selection) http://graasp.eu/ils/555c388658351538d11ecec0?lang=et
Learning outcomes	Students were expected to develop key inquiry skills such as identifying variables and formulating hypotheses. These skills were later tested using the TIPS (Test for Integrated Process Skills) inquiry assessment test.

Photos or other relevant material	  

G O - L A B Report Code	EEUTE-140415
Title	Activity with students
Country City/Region	Estonia / Tartu
Working language	Estonian
Start/End Date	14/04/2015 (45 minutes)
Partners Involved	UTE
Coordinator name and email	Mario Mäeots, mario.maeots@ut.ee
School Profile	Tartu Kivilinna Kool (Tartu Kivilinna Basic School) https://www.kivilinn.tartu.ee is a public basic school in Tartu, Estonia.
Number and age of students	24 students, age 13-14 years old
Activity Description	As part of a science class lesson, basic school students went to the computer lab and learnt about relative density by using the Go-Lab inquiry learning environment. Students were asked to independently complete the Inquiry Learning Space *Plärts!* (*Splash!*). In this Inquiry Learning Space students had to formulate research questions, hypotheses, an experimental plan and make conclusions based on evidence collected from a virtual lab. Two researchers from the University of Tartu were involved in implementing this activity.
Implemented online labs	Plärts! (Splash!) http://graasp.eu/ils/552cc1c3680bfb937acf42c0?lang=et
Learning outcomes	Students were expected to develop key inquiry skills such as identifying variables and formulating hypotheses. These skills were later tested using the TIPS (Test for Integrated Process Skills) inquiry assessment test.

Photos or other relevant material	  

4.5 Germany

During Phase-B UDE conducted and coordinated 6 implementation activities which are listed in the following table. In the training activities for science teachers that were organized, there were 54 participants from 24 schools, where the Osmosis and Electricity labs were presented and practiced along with their fully developed ILSs in German. The subject domains of these activities and labs focused on physics, chemistry and technology.

Date(s)	Activity type	Participants (Schools)	Labs	Subject(s)
13/11/2014	Training of teachers	8 (1)	Osmosis lab , Electricity lab	Chemistry, Physics, Technology
19/11/2014	Training of teachers	25 (10)	Osmosis lab , Electricity lab	Chemistry, Physics, Technology
02/02/2015	Training of teachers	5 (1)	Osmosis lab, Electricity lab, Craters on Earth, GearSketch	Chemistry, Physics, Technology
20/06/2015	Training of teachers	12 (10)	Osmosis Lab, Electricity Lab, Star in a Box, Build an Atom, Splash	Chemistry, Physics, Technology, Astronomy
24/06/2015 13/07/2015	Training of teachers	4 (2)	Osmosis Lab, Electricity Lab, Star in a Box, Build an Atom, Splash	Chemistry, Physics, Technology, Astronomy

G O - L A B Event Code	DE10-131114
Title	Introduction to Go-Lab with overview of Labs and ILSs
Country City/Region	Germany, Oberhausen
Working language	German
Start/End Date	13/11/14
Organizing Institute	University of Duisburg-Essen
Coordinator name and email	Adam Giemza, giemza@collide.info
Activity Form	in-school activity
Activity Type	Local
Total number of teachers/schools	8 teachers from one school
Implemented online labs	Osmosis Lab, Electricity Lab
Brief description	This activity was mainly intended to introduce Go-Lab as a project and online labs to selected teachers including the principle of the school. The content was a general description of the project, the partners and the goals. Several labs and mainly two ILSs have been presented.
Learning outcomes	Participants have mainly learned about the project and its main goals. They have seen examples of ILSs and have been introduced how to use them. Two teachers have requested an additional hands-on that have been carried out in the last hour of the session. The teachers indicated that they would further experiment with ILSs and contact us on demand. The outcome of this meeting is a planned half day teacher workshop at the University with invitations to further teachers on the 2nd of February in 2015. Some other (non- STEM) teachers asked if this approach could be also applied outside the scientific context. After some discussions one concrete proposal have been developed with focus on theater role play and video combinations.

G O - L A B Event Code	DE10-191114
Title	Introduction to Go-Lab with overview of Labs and ILSs
Country City/Region	Germany, Essen
Working language	German
Start/End Date	19/11/14
Organizing Institute	University of Duisburg-Essen
Coordinator name and email	Sven Manske, manske@collide.info
Activity Form	Advanced Training and Reflection
Activity Type	National
Total number of teachers/schools	25 teachers from 10 schools
Implemented online labs	Osmosis Lab, Electricity Lab and individual choices in the hands-on part
Brief description	The activity was an extended (5hrs) and official teacher training, which aimed at introducing the Go-Lab idea, reporting about a success story (regarding an implementation activity), and learning how to create an ILS starting from the Go-Lab inventory.
Learning outcomes	Participants have mainly learned about the project and its main goals. They have seen examples of ILSs and have been introduced how to use them. The teachers learned how to find useful labs and apps and how to create an ILS that suits their demands.
Website	https://ktapps.lvr.de/KTeam/Event/pdf/25318.pdf

Photos or other relevant material	 
Event agenda	➢ Go-Lab: Experimentation with Online Labs ➢ Success Story: Go-Lab at the Otto-Hahn-Gymnasium ➢ Demo: Go-Lab – From the Inventory to a Scenario ➢ Hands-on Part ▪ Labs, Apps and Templates ▪ Creation of a Scenario

G O - L A B Event Code	DE10-020215
Title	Introduction to Go-Lab with overview of Labs and ILSs
Country City/Region	Germany, Duisburg
Working language	German
Start/End Date	02/02/15
Organizing Institute	University of Duisburg-Essen
Coordinator name and email	Sven Manske, manske@collide.info
Activity Form	Training and Reflection
Activity Type	Local
Total number of teachers/schools	5 teachers
Implemented online labs	Osmosis Lab, Electricity Lab, Craters on Earth and Other Planets, GearSketch, Our Acidifying Ocean
Brief description	This activity was mainly intended to introduce Go-Lab to the teachers. Coming from a general view on the project, we presented the idea of inquiry-based science education as well as the Go-Lab inventory. After a demonstration of some online labs in the subject domains of the teacher they could learn in an extensive hands-on part how to build an ILS in the Graasp authoring environment. Finally, the teachers could brainstorm about lesson plans, exchange experiences and discuss suggestions and feature requests.
Learning outcomes	Participants have mainly learned about the project and how to use Graasp to build ILSs that can be used in inquiry-based science education in class. They have seen examples of ILSs and have been explained how to use them. They showed interest in the idea of having labs for all kind of scientific problems and asked whether several labs concerning certain topics could also be built. There was also the question if the ILSs could possibly be used offline because a lot of schools don't seem to have well working internet connections.
Website	none

Photos or other relevant material	 
Event agenda	- Go-Lab: Goals, Inquiry-based science education, Go-Lab in schools - Demo: From the Go-Lab inventory to an ILS (Labs, Authoring and distribution of materials) - Hands-on: ILS authoring – Bring your own lab! - Discussion and Reflection - Announcement: Go-Lab Contest 2015 und retrospective to the Summer School 2014

G O - L A B Event Code	DE_-200615
Title	Go-Lab: Experimenting with Virtual und Remote Labs
Country City/Region	Germany, Chemnitz
Working language	German
Start/End Date	20/06/15
Organizing Institute	University of Duisburg-Essen
Coordinator name and email	Kristina Angenendt, angenendt@collide.info
Activity Form	Training and Reflection
Activity Type	National
Total number of teachers/schools	2 following workshops (45 minutes each), 6 teachers per workshop = 12 teachers in total
Implemented online labs	Osmosis Lab, Electricity Lab, Star in a Box, Build an Atom, Splash Lab
Brief description	This activity was mainly intended to introduce Go-Lab as a project and online labs to teachers. The content was a general description of the project and introducing the Go-Lab idea, as well as demonstrating how to build an ILS in the Graasp authoring environment. Several labs, apps, the OsmoCity ILS, and an Ohm's Law ILS have been presented. Afterwards, the teachers had the chance to create their own ILS in a hands-on activity and ask questions about Go-Lab and its usage.
Learning outcomes	Participants have mainly learned about the project, example ILSes and Labs, and how to use Graasp to build ILSs that can be used in class or use already existing ILSes. The teachers had a lot of questions about the technical side of the project and the resources that are necessary to implement ILSes in class. They welcomed that a lot of labs are already implemented in HTML5. Some teachers wanted to know about the possibilities to adjust for example the Electric Circuit Simulator to their needs by adding different energy sources and so on. They really liked the already existing possibilities to adjust the content of pre-defined concepts or hypothesis-parts in the corresponding apps.
Website	none

Photos or other relevant material	 
Event agenda	- Go-Lab's ideas and possibilities - Golabz.eu's inventory, apps, labs, and ILSes - Hands-on part

G O - L A B Event Code	DE_-240615
Title	Go-Lab: Experimenting with Virtual und Remote Labs
Country City/Region	Germany, Duisburg
Working language	German
Start/End Date	24/06/15
Organizing Institute	University of Duisburg-Essen
Coordinator name and email	Kristina Angenendt, angenendt@collide.info
Activity Form	Training and Reflection
Activity Type	Online
Total number of teachers/schools	2 teachers
Implemented online labs	Osmosis Lab, Electricity Lab, Star in a Box, Build an Atom
Brief description	This activity was mainly intended to introduce Go-Lab as a project and online labs to teachers. The content was a general description of the project and introducing the Go-Lab idea, as well as demonstrating how to build an ILS in the Graasp authoring environment. Several labs, apps, the OsmoCity ILS, and an Ohm's Law ILS have been presented. Afterwards, the teachers had the chance to ask questions about Go-Lab and its usage.
Learning outcomes	Participants have mainly learned about the project and how to use Graasp to build ILSs that can be used in class or use already existing ILSes. The teachers were very enthusiastic and expressed that they have literally been searching for a project like Go-Lab and all its possibilities to be able to support learners in inquiry learning and make them use virtual and online environments. They were very positive about the number of already existing labs and were wondering about the possibility to change the language of the ILSes, Labs, and Apps. They also welcomed that ILSes do give the possibility to form group work that can be supported and observed by the teachers in the classroom itself and that learners can upload their very own learning outcomes, for example concept maps or wiki articles.
Event agenda	- Go-Lab's ideas and possibilities - Golabz.eu's inventory, apps, labs, and ILSes - Questioning-Part

G O - L A B Event Code	DE_-130715
Title	Go-Lab: Experimenting with Virtual und Remote Labs
Country City/Region	Germany, Duisburg
Working language	German
Start/End Date	13/07/15
Organizing Institute	University of Duisburg-Essen
Coordinator name and email	Kristina Angenendt, angenendt@collide.info
Activity Form	Training and Reflection
Activity Type	Online
Total number of teachers/schools	2 teachers
Implemented online labs	Osmosis Lab, Electrical Circuit Simulator, Star in a Box, several Apps, OsmoCity ILS
Brief description	This activity was mainly intended to introduce Go-Lab as a project and online labs and apps to teachers. The content was a general description of the project and introducing the Go-Lab idea, as well as demonstrating how to use ILS and labs and apps of several domains, and how to build an ILS in the Graasp authoring environment. Afterwards, the teachers had the chance to ask questions about Go-Lab and its usage.
Learning outcomes	Participants have mainly learned about the project and how to use Graasp to build ILSs that can be used in class or use already existing ILSes. The teachers were really interested and told me that they had high hopes that Go-Lab can be used in school. When told about our experiences with students they seemed to be quite surprised that online laboratories can cause so much motivation and engagement for students. One of the teachers has been in contact with me for a few months now, so I really think that she'll be joining Go-Lab soon.
Event agenda	- Go-Lab's ideas and possibilities - Golabz.eu's inventory, apps, labs, and ILSes - Graasp - Questioning-Part

4.6 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-B there were 3 major teacher training events, one of which at international level, with 100 participants, and 13 activities with students, with 471 participants from 54 schools. A large variety of subjects and labs were used (e.g. ESA-SOHO dataset, SalsaJ, Geogebra, Radioactivity, Gearsketch, Balancing Act PhET, Splash, PhET Buoyancy Density, HYPATIA, iSpyCMS), covering curriculum subjects from physics, astronomy, biology, maths, engineering and technology (see table below). Phase-B concluded with the Go-Lab Summer School, organized by EA in Marathon on 12-17 Jul 2015, in collaboration with partners of the consortium. The summer school was a week-long intensive course on the use of online labs is science education. 28 teachers from 15 countries around Europe participated and developed cross-thematic ILSs on various curriculum topics using in full the Go-Lab approach and repository of labs and tools.

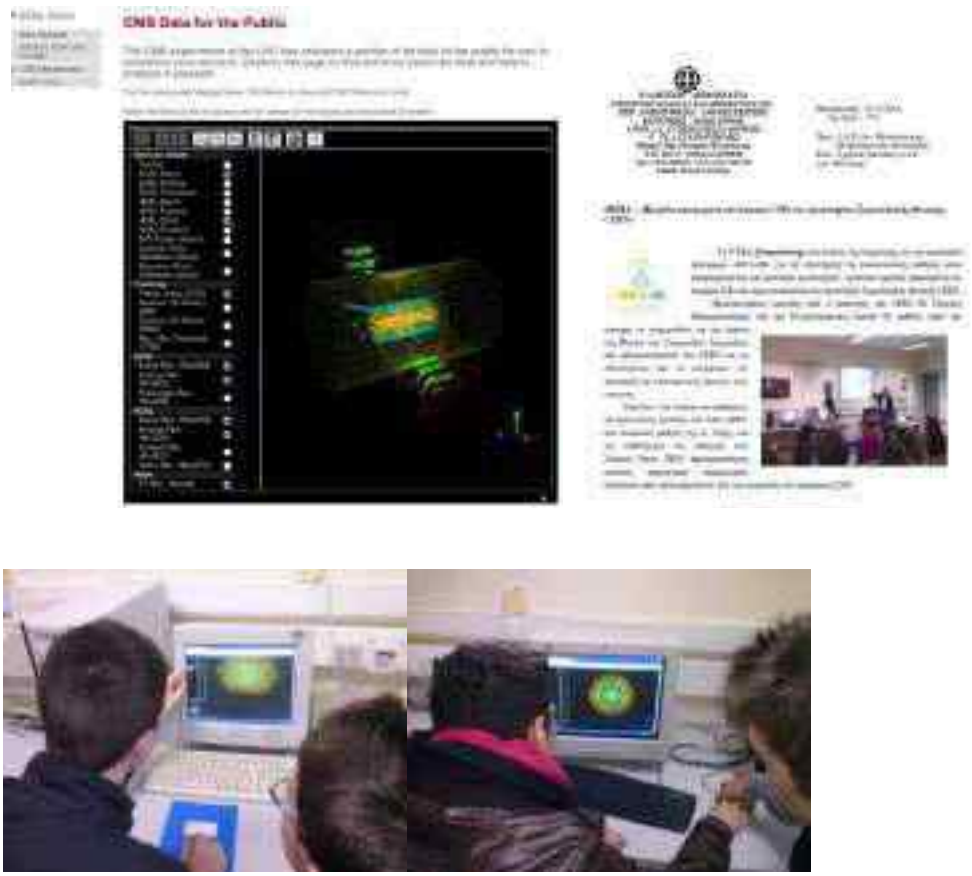
EA is also national coordinator in Bulgaria and Romania. Although in these countries there is large expression of interest form schools to join the project nevertheless great difficulty has been experienced in organizing activities there mainly due to the fact that teachers have poor knowledge of English language. To overcome this a small group of teachers has been identified, including teachers that participated in previous summer schools, that could act as local coordinators or/and translate teacher support materials and ILSs in the native languages. This is expected to improve the situation for the implementation Phase-C.

Partner(s)	Date(s)	Type	Participants (Schools)	Labs	Subject(s)
EA	12/11/2014	Activity with students	18 (1)	iSpyCMS	Physics
EA	03/12/2014	Activity with students	25 (1)	iSpyCMS	Physics
EA	01/04/2015 04/05/2015	Activity with students	40 (1)	iSpyCMS	Physics
EA	10/03/2015 06/05/2015	Activity with students	22 (1)	iSpyCMS	Physics
EA	01/10/2014 – 10/05/2015	Activity with students	43 (1)	ESA-SOHO dataset, SalsaJ, Geogebra, Radioactivity, Gearsketch, Balancing Act PhET	Physics, Maths, Biology, Astronomy, Engineering, Technology
EA	01/04/2015 - 29/04/2015	Activity with students	48 (8)	Splash, PhET Buoyancy Density	Physics

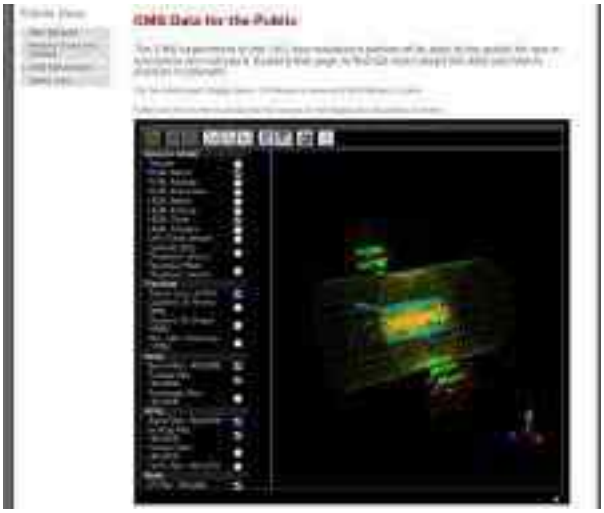
EA, IASA	21/10/2014	Training of teachers	36 (30)	Hypatia	Physics
IASA	11/11/2014	Activity with students	25 (1)	Hypatia	Physics
IASA	26/11/2014	Training of teachers	35 (10)	Hypatia	Physics
IASA	29/01/2015	Activity with students	40 (5)	Hypatia	Physics
IASA	12/02/2015	Activity with students	50 (3)	Hypatia	Physics
IASA	26/02/2015	Activity with students	60 (12)	Hypatia	Physics
IASA	14/03/2015	Activity with students	100 (20)	Hypatia	Physics
EA (organizer) and EPFL, UT,NUCLIO, USW, ULEIC	12/07/2015 - 17/07/2015	Training of teachers	28 (28)	SOHO, Geogebra, Star in a box, Sun4all, , SalsaJ, PhET labs, etc	Physics, Technology, Biology, Ecology, Astronomy, Chemistry

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

G O - L A B Report Code	GR02-12112014
Title	High school students analyze data from particle physics experiment at CERN
Country City/Region	Greece, Thessaloniki, Stavroupoli
Working language	Greek and English
Start/End Date	12/11/2014
Partners Involved	EA
Coordinator name and email	G.Mavromanolakis gmavroma@ea.gr
School Profile	4th High-school (Lyceum) of Stavroupolis, Thessaloniki. The school has long tradition of participation in EU educational projects and on implementing innovative teaching methods.
Number and age of students	18 high school students, age 16-17 years old
Activity Description	The educational activity consists of two parts, each about two hours long, implemented on 12/11/2014. In the former part students attend a lecture by G. Mavromanolakis (former researcher at CERN) on particle physics research, science and technology. 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	

G O - L A B Report Code	GR02-03122014
Title	High school students analyze data from particle physics experiment at CERN
Country City/Region	Greece, Tzermiado, Crete
Working language	Greek and English
Start/End Date	03/12/2014
Partners Involved	EA
Coordinator name and email	G.Mavromanolakis gmavroma@ea.gr
School Profile	1st high-school of Tzermiado in Crete is a rural state school with pioneering teachers who are using innovative STEM teaching to spark the interest of students in science and technology
Number and age of students	25 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	  

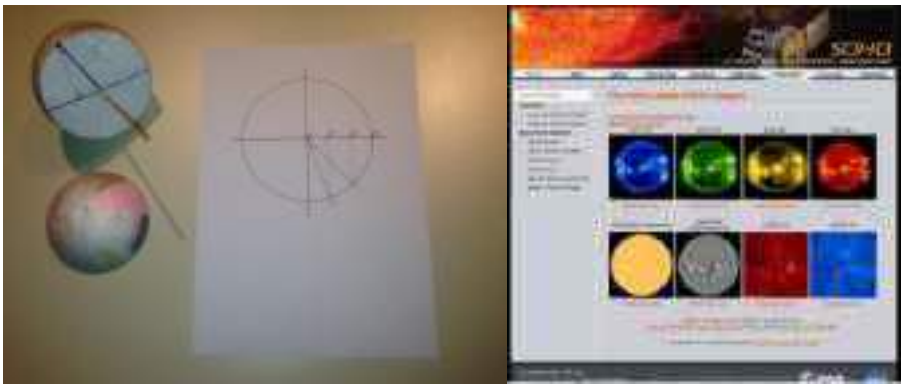
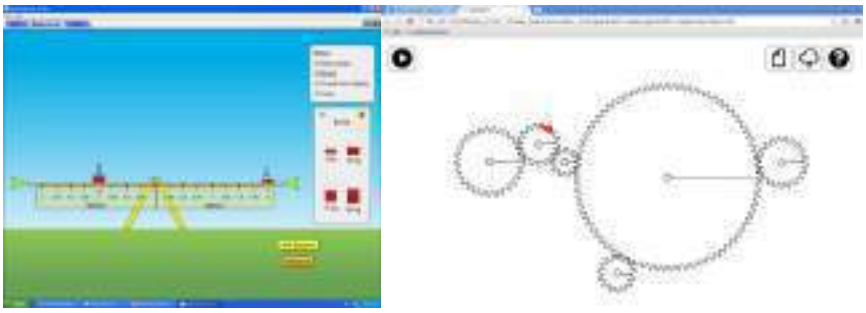
G O - L A B Report Code	GR02-04052015
Title	High school students analyze data from particle physics experiment at CERN
Country City/Region	Greece, Nikaia-Athens
Working language	Greek and English
Start/End Date	01/04/2015 and 04/05/2015
Partners Involved	EA
Coordinator name and email	G.Mavromanolakis gmavroma@ea.gr
School Profile	5th Junior high-school of Nikaia, Athens (Gymnasium). The school has recently started participating actively in EU educational projects and on implementing innovative teaching methods and technologies
Number and age of students	40 (2 classes) of junior high school students, age 13-16 years old
Activity Description	The educational activity consists of two parts, each about two hours long, implemented on 01/04/2015 and on 04/05/2015 respectively. In the former part students attend a lecture by G. Mavromanolakis (former researcher at CERN) on particle physics research, science and technology. 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	 

G O - L A B Report Code	GR02-06052015
Title	High school students analyze data from particle physics experiment at CERN
Country City/Region	Greece, Ag.Anargyroi, Athens
Working language	Greek and English
Start/End Date	10/03/2015 and 06/05/2015
Partners Involved	EA
Coordinator name and email	G.Mavromanolakis gmavroma@ea.gr
School Profile	1st Junior high-school of Ag.Anargyroi, Athens (Gymnasium - Protypo). The school has recently started participating actively in EU educational projects and on implementing innovative teaching methods and technologies
Number and age of students	22 junior high school students, age 13-16 years old
Activity Description	The educational activity consists of two parts, each about two hours long, implemented on 10/03/2015 and on 06/05/2015 respectively. In the former part students attend a lecture by G. Mavromanolakis (former researcher at CERN) on particle physics research, science and technology. In the following month a group of students made an educational excursion to CERN. 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	   

G O - L A B Report Code	GR02-10052015
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	From 01/10/2014 to 10/05/2015
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	In total about 43 high school students (3 classes), age 16-18 years old
Activity Description	During the school period, from 1/10/2014 until 10/05/2015, various educational activities were implemented in EA Lyceum as part of the standard curriculum program or as extra-curricular sessions. Activity “Measure the self-rotation period of the Sun”. During the activity students use ESA-SOHO dataset, SalsaJ, Geogebra 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. Activity “Is radioactivity harmful?” During this activity students learn and study what is radiation and radioactivity, its applications and effects in human health. Students use the Radioactivity lab and experimental error tool and also the related ILSs in English and Greek language. Activity “What is torque? How gears work?” In this activity students understand the concept of torque, balance and equilibrium and how gears and levers work. They use the gearsketch lab, and the balancing act simulation and game from PhET collection

Implemented online labs	ESA-SOHO dataset, SalsaJ, Geogebra, Radioactivity lab, Gearsketch lab, Balancing Act PhET
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	Activity “Measure the self-rotation period of the Sun”  Activity “Is radioactivity harmful?”  Activity “What is torque? How gears work?”  

G O - L A B Report Code	GR02-29042015
Title	“Little crafts and great challenges” educational contest for junior high school students
Country City/Region	Greece, Kerkyra
Working language	Greek
Start/End Date	01/04/2015 – 29/04/2015
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	16 student teams from 8 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	48 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 lab, PhET simulations (buoyancy, density)
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).

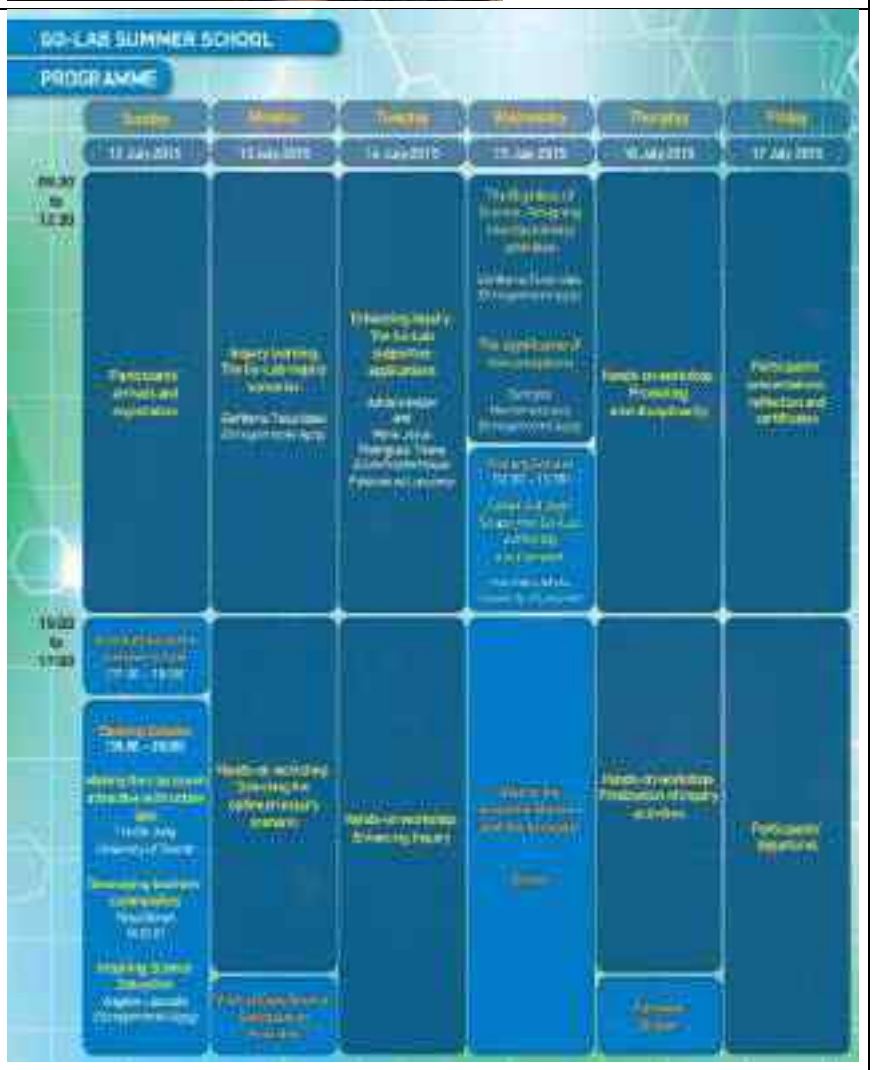
Photos or other relevant material	       

G O - L A B Event Code	GR02-21102014
Title	Masterclasses – Teachers' Day
Country City/Region	Greece, Serres
Working language	Greek
Start/End Date	21/10/2014
Organizing Institute	Ellinogermaniki Agogi, IASA
Coordinator name and email	Tsourlidaki Eleftheria eleftheria@ea.gr, Christine Kourkoumelis Christine.Kourkoumelis@cern.ch
Activity Form	Project presentation, training with Go-Lab labs, Validation Workshop on the "Big Ideas of Science"
Activity Type	Local
Total number of teachers/schools	36 science teachers from 30 high schools of the area of Serres
Implemented online labs	HYPATIA
Brief description	The workshop took place at the city of Serres at a local school. The objective of the workshop was to present the Go-Lab project; the Go-Lab overall approach, repository, labs and ILSs. In addition teachers were introduced to the "Big Ideas of Science" as a means of an organization/recommendation system of activities for the school classroom. They also had a hands-on training workshop using the HYPATIA lab and related ILSs.
Learning outcomes	Acquaintance with the Go-Lab project Familiarization with Go-Lab ILSs and online labs Familiarization with the "Big Ideas of Science" and how they may be communicated by teachers so as to provide students with a clearer connection between the different subjects they are taught at school. Training on the use of the HYPATIA lab and related ILSs.
Website	http://ekfe.ser.sch.gr/site/index.php/nea/42-proxorimena-mathimata-fysikis-somatidion-masterclasses-teachers-day

Photos or other relevant material	  
Event agenda	11:30-12:00 Introduction to CERN and the ATLAS experiment. 12:00-13:00 Searching for the Higgs boson. – Hands-on activity using HYPATIA lab and ILSs 13:00-14:30 The Big Ideas of Science

G O - L A B Event Code	GR02-17072015
Title	International Science Teachers Training Course
Country City/Region	Marathon, Greece
Working language	English
Start/End Date	12/07/2015 – 17/07/2015
Organizing Institute	Ellinogermaniki Agogi (EA)
Coordinator name and email	Tsourlidaki Eleftheria *eleftheria@ea.gr* Mavromanolakis Georgios *gmavroma@ea.gr* Sofoklis Sotiriou *sotiriou@ea.gr*
Go-Lab Partners that were also Involved	Ton De Jong(UT), Adrian Holzer(EPFL), Maria Jesus Rodriguez Triana (EPFL), Rob Edlin-White (ULEIC), Fraser Lewis (CU), Rosa Doran (NUCLIO)
Activity Form	Summer School
Activity Type	International
Total number of teachers/schools	28 teachers from 28 schools (winners of the Golab teachers contest) from 14 countries
Implemented online labs	Sun4All, Phet labs, SOHO, Geogebra, Star in a box, and several new other labs that teachers found and proposed
Brief description	Summer School for science teachers on: - the IBSE teaching approaches - the use of on-line labs - the Go-Lab authoring environment - the Go-Lab supportive application - creating activities through collaboration between teachers All participants worked in teams. Each team prepared one ILS. The common theme among all ILSs was the Sun. The ILS produced are listed below: • Team “Solar Structures”: Solar Structure (SHM) *http://www.golabz.eu/spaces/solar-structure-shm* • Team “Stellar Evolution”: Star Evolution *http://www.golabz.eu/spaces/star-evolution* • Team “Photosynthesis”: The Sun Fuels Our Planet *http://www.golabz.eu/spaces/sun-fuels-our-planet* • Team “Celestial Motions”: Motion in Solar System *http://www.golabz.eu/spaces/motion-solar-system*

	• Team “Solar Energy generation”: Reações Fotoquímicas *http://www.golabz.eu/spaces/rea%C3%A7%C3%B5es-fotoqu%C3%ADmicas* • Team “Heat”: Solar Water Heating *http://www.golabz.eu/spaces/solar-water-heating* • Team “Shadows”: How do shadows change? *http://www.golabz.eu/spaces/how-do-shadows-change* • Extra ILS: Solar Energy *http://www.golabz.eu/spaces/solar-energy*
Learning outcomes	Acquaintance with the IBSE approach and the Go-Lab scenarios. Training on the use of the Go-Lab Inquiry Learning Spaces. Training on the use of the Go-Lab tools and services. Acquaintance with the “Big Ideas of Science”
Website	http://golab.ea.gr/
Photos or other relevant material	   

	
Event agenda	

G O - L A B Report Code	GR18-11112014
Title	Half day workshop on HYPATIA and the ATLAS experiment in the 4th General Lyceum of Petroupolis
Country City/Region	Greece, Attiki, Athens
Working language	Greek
Start/End Date	11/11/2014
Partners Involved	IASA
Coordinator name and email	Christine Kourkoumelis, hkourkou@phys.uoa.gr
School Profile	The 4th General Lyceum has several hundred of students and serves a wide area in the outskirts of Athens. It has a well-equipped Physics lab as well as a computer lab with ~20 PC's
Number and age of students	25 high school students and 5 teachers
Activity Description	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 visit to CERN Program of the day: 9:30-10:30 Introduction to the ATLAS and the new Boson 11:00-11:30 Introduction to HYPATIA and the on-line analysis 11:30-13:00 Hands-on lab at the school's computer lab 13:00 – 14:00 Virtual Visit to the ATLAS experiment at CERN
Implemented online labs	HYPATIA
Learning outcomes	- 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 Report Code	GR18-26112014
Title	Half day presentation and discussion on the ATLAS experiment and the HYPATIA analysis tool in the 4th General Lyceum of Korinthos, Greece.
Country City/Region	Greece, Korinthos
Working language	Greek
Start/End Date	26/11/2014
Partners Involved	IASA
Coordinator name and email	Christine Kourkoumelis, hkourkou@phys.uoa.gr
School Profile	The 4th General Lyceum of Corinth serves the city of Corinth in the Peloponnese. It has several hundreds of students. It has excellent facilities including a large amphitheater and a well-equipped computer lab with ~15 PCs.
Number and age of students	35 high school teachers from the Korinth prefecture.
Activity Description	The objective of the talks was to present the ATLAS experiment, the Go-Lab project and the Go-Lab repository to the teachers of the Korinth prefecture. There has been live on-line demonstration of the Go-lab ILSs which are connected with the HYPATIA tool. The teachers also took part in a virtual visit to CERN and had the opportunity to ask questions to the researchers present at CERN. This was in the framework of the school's future visit to CERN Program of the day: 10:00-11:00 Introduction to CERN, ATLAS and the new Boson 11:00-11:30 Break 11:30-13:00 Presentation of the GoLab project, GoLab portal and relevant ILSs (HYPATIA) and resources 13:00 – 14:00 Virtual Visit to the ATLAS experiment at CERN
Implemented online labs	HYPATIA
Learning outcomes	- Acquaintance with the Go-Lab project - Familiarization with Go-Lab ILSs and online labs - Familiarization with the HYPATIA event analysis tool

Photos or other relevant material

G O - L A B Report Code	GR18-29012015
Title	Half day presentation and discussion on the ATLAS experiment and the HYPATIA analysis tool in the 3rd General Lyceum of Argos, Greece.
Country City/Region	Greece, Argos.
Working language	Greek
Start/End Date	29/1/2015
Partners Involved	IASA
Coordinator name and email	Christine Kourkoumelis, hkourkou@phys.uoa.gr
School Profile	The 3rdh General Lyceum of Corinth serves the city of Argos in the Peloponnese. It has several hundreds of students. For this activity a call to all the schools of the prefecture of Argolida was issued. Twelve schools from as far as 100km away responded bringing about 4 selected students each..
Number and age of students	40 high school students and 10 teachers from the Argolida prefecture.
Activity Description	The objective of the talks was to present the ATLAS experiment, the Go-Lab project and the Go-Lab repository to the students and their teachers of the Argolida prefecture. This activity is repeated for the 3rd consecutive year. There has been live on-line demonstration of the Go-lab ILSs which are connected with the HYPATIA tool. The students then used the HYPATIA tool to search for Z and Higgs boons. At the end of the day they took part in a virtual visit to CERN and had the opportunity to ask questions to the researchers present at CERN. Program of the day: 10:00-11:00 Introduction to CERN, ATLAS and the new Boson, presentation of the GoLab project and GoLab portal 11:00-11:30 Break 11:30-13:00 Hands-on in PC's:the students used the HYPATIA tool to look for Z and Higgs bosons 13:00 – 14:00 Virtual Visit to the ATLAS experiment at CERN
Implemented online labs	HYPATIA ILS's http://graasp.eu/ils/547311d9e9934012b7c65f88?lang=en http://graasp.eu/ils/547311dfe9934012b7c65f8a?lang=en
Learning outcomes	Acquaintance with the Go-Lab project Familiarization with Go-Lab ILSs and online labs Familiarization with the HYPATIA event analysis tool

Photos or other relevant material	 

G O - L A B Report Code	GR18-12022015
Title	Half day presentation and discussion on the ATLAS experiment and the HYPATIA analysis tool in the Doukas school
Country City/Region	Halandri, Attica
Working language	Greek
Start/End Date	12/2/2015
Partners Involved	IASA
Coordinator name and email	Christine Kourkoumelis, hkourkou@phys.uoa.gr
School Profile	The Doukas school is a private school but for this event students from two more schools were invited. One was the Varvakio innovative school and its students were the ones who won the “beamline for CERN” competition.
Number and age of students	50 high school students and 5 teachers from the Halandri region
Activity Description	The objective of the talks was to present the ATLAS experiment, the Go-Lab project and the Go-Lab repository to the students and their teachers of the three schools. There has been live on-line demonstration of the Go-lab ILSs which are connected with the HYPATIA tool. The students then used the HYPATIA tool to search for Z and Higgs boons. At the end of the day they took part in a virtual visit to CERN and had the opportunity to ask questions to the researchers present at CERN. Program of the day: 10:00-11:00 Introduction to CERN, ATLAS and the new Boson. Presentation of the GoLab project and GoLab portal 11:00-11:30 Break 11:30-13:00 Hands-on in PC’s:students use the HYPATIA tool to look for Z and Higgs bosons 13:00 – 14:00 Virtual Visit to the ATLAS experiment at CERN
Implemented online labs	HYPATIA ILs’s http://graasp.eu/ils/547311d9e9934012b7c65f88?lang=en http://graasp.eu/ils/547311dfe9934012b7c65f8a?lang=en
Learning outcomes	Acquaintance with the Go-Lab project Familiarization with Go-Lab ILSs and online labs Familiarization with the HYPATIA event analysis tool

Photos or other relevant material	

G O - L A B Event Code	GR18-14032015
Title	International IPPOG Physics Masterclass in the University of Crete in Heraklion
Country City/Region	Greece, Heraklion, Crete
Working language	Greek
Start/End Date	14/3/2015
Organizing Institute	IASA
Coordinator name and email	Christine Kourkoumelis, hkourkou@phys.uoa.gr
Activity Form	Seminar,hands-on,training
Activity Type	Local (students from all over Crete)
Total number of teachers/schools	100 students from 20 schools
Implemented online labs	HYPATIA “discover the Z and Higgs boson ILSs”
Brief description	100 high school students from all over Crete came to the University of Crete for one day in order to learn about particle physics, CERN and become researchers for a day. In the morning, lectures are given by professors from the University of Crete and the University of Athens. In the afternoon the students attended a hands-on experience, with introduction to Go-lab and the relevant ILSs. Furthermore, the students used the HYPATIA event display to look for Z and Higgs bosons (with two Go-lab ILSs). At the end of the day the students compared their results with those of other institutions from other countries in a videoconference with CERN, two schools from Poland and two from Portugal.
Learning outcomes	The students are introduced to the world of high energy physics and the work being done at CERN. They get the chance to learn about the new discoveries of physics in that field. They also get a taste of what it’s like to be an actual physicist searching for new particles in the laboratory exercise with HYPATIA.
Website	http://hep.physics.uoc.gr/events/masterclasses/masterclass-2015/images.php

Photos or other relevant material	 
Event agenda	GO-LAB **11th INTERNATIONAL PARTICLE PHYSICS MASTERCLASSES 2015** **ΤΜΗΜΑ ΦΥΣΙΚΗΣ ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ** **ΣΑΒΒΑΤΟ 14 ΜΑΡΤΙΟΥ 2015** **09:00 – 10:00 Κεντρική Είσοδος Κτιρίου Φυσικού Τμήματος** Εγγραφές Μαθητών/Καθηγητών Λυκείων **10:00 – 11:00 Αμφιθέατρο Α** Θεωρητική Διάλεξη *(Θ. Τσαρούχας, Παν/μιο Κρήτης)* **11:00 – 11:30 Αμφιθέατρο Α** Τα αποτελέσματα του Πειράματος ATLAS *(Δ. Φασουλιώτης, Παν/μιο Αθηνών)* **11:30 – 12:00 Αμφιθέατρο Α** Ο ανιχνευτής ATLAS και το πρόγραμμα ανάλυσης HYPATIA *(Χρ. Κουρκουμέλη, Παν/μιο Αθηνών)* **12:00 – 13:00 Αμφιθέατρο Α** Ερωτήσεις *(Θ. Τσαρούχας, Χρ. Κουρκουμέλη, Δ. Φασουλιώτης)* **13:00 – 14:00 Φαγητό** **14:00 – 14:30 Αίθουσες Υπολογιστών** Εισαγωγή στην Ερευνητική Εργασία *(Στ. Βουρδάκης, Παν/μια Αθηνών και ΙΕΣΕ)* **14:30 – 16:15 Αίθουσες Υπολογιστών** Επεξεργασία Γεγονότων LHC με το Πρόγραμμα HYPATIA *(Γ.Βασιλειάδης , Στ. Βουρδάκης Παν/μιο Αθηνών και ΙΕΣΕ)* **14:30 – 16:15 Αίθουσα ???** Εισαγωγή στα εργαλεία διαθέσιμα για τους καθηγητές *(Χ.Κουρκουμέλη Παν/μιο Αθηνών)* **16:15 – 16:45 Αίθουσες Υπολογιστών** Συλλογή Αποτελεσμάτων

G O - L A B Event Code	GR18-26022015
Title	International IPPOG Physics Masterclass in the University of Athens
Country City/Region	Greece, Athens
Working language	Greek
Start/End Date	26/2/2015
Organizing Institute	IASA
Coordinator name and email	Christine Kourkoumelis, hkourkou@phys.uoa.gr
Activity Form	Seminar,hands-on,training
Activity Type	Local (students from the Attica region)
Total number of teachers/schools	60 students from 12 schools
Implemented online labs	HYPATIA “discover the Z and Higgs boson ILSs”
Brief description	60 high school students from the wider area of Athens came to the premises of the University of Athens for one day in order to learn about particle physics, about CERN and become researchers for a day. In the morning, lectures were given by professors from the University of Athens on nuclear and particle physics. In the afternoon the students attended a hands-on experience, with introduction to Go-lab and the relevant ILSs. Furthermore, the students used the HYPATIA event display to look for Z and Higgs bosons (with two Go-lab ILS). At the end of the day the students compared their results with those of other institutions from other countries (France and Italy) in a videoconference with CERN.
Learning outcomes	The students are introduced to the world of high energy physics and the work being done at CERN. They get the chance to learn about the new discoveries of physics in that field. They also get a taste of what it’s like to be an actual physicist searching for new particles in the laboratory exercise with HYPATIA.
Website	http://nuclpart.phys.uoa.gr/GR/outreach.gr.php

Photos or other relevant material	
Event agenda	Πανεπιστήμιο Αθηνών 26η Φεβρουαρίου 2015 MasterClasses στη φυσική των σωματιδίων GO-LAB ΠΡΟΓΡΑΜΜΑ 09:00-09:45 Έναρξη – Χαιρετισμός από τον Πρόεδρο του Τμήματος Φυσικής: Καθ. Γ.Τσιμπρα 09:45-10:15 «Πώς να γίνετε σι της Αλίκης; (Η Πειραματική Φυσική σήμερα)» Επικ.Καθ Θ.Μαρτζώκος 10:15-10:45 «Από τι είναι φτιαγμένος ο κόσμος;» Αναπλ.Καθ .Δ. Φασουλιώτης 10:45-11:15 «Εισαγωγή στους Επιταχυντές και τους ανιχνευτές» Καθ Χ. Κουρκουμέλη 11:15-11:30 Διάλειμμα 11:30-12:15 «Τα μεγάλα ερωτήματα στο LHC» Επικ.Καθ Ν. Σαουλίδου 12:15-13:00 Συζήτηση-Ερωτήσεις 13:00-14:00 Γεύμα 14:00-14:30 Εισαγωγή στην Ανίχνευση - Ανάλυση 14:30-16:15 Εργαστηριακή άσκηση «Ανάλυση γεγονότων σε υπολογιστή από τους μαθητές 16:30-17:00 Συλλογή αποτελεσμάτων - Προετοιμασία για video conference 17:00-18:00 Video conference/ Quiz 18:00-19:30 Συζήτηση – Συμπεράσματα- Αναμνηστικό διάλειμμα

4.7 The Netherlands

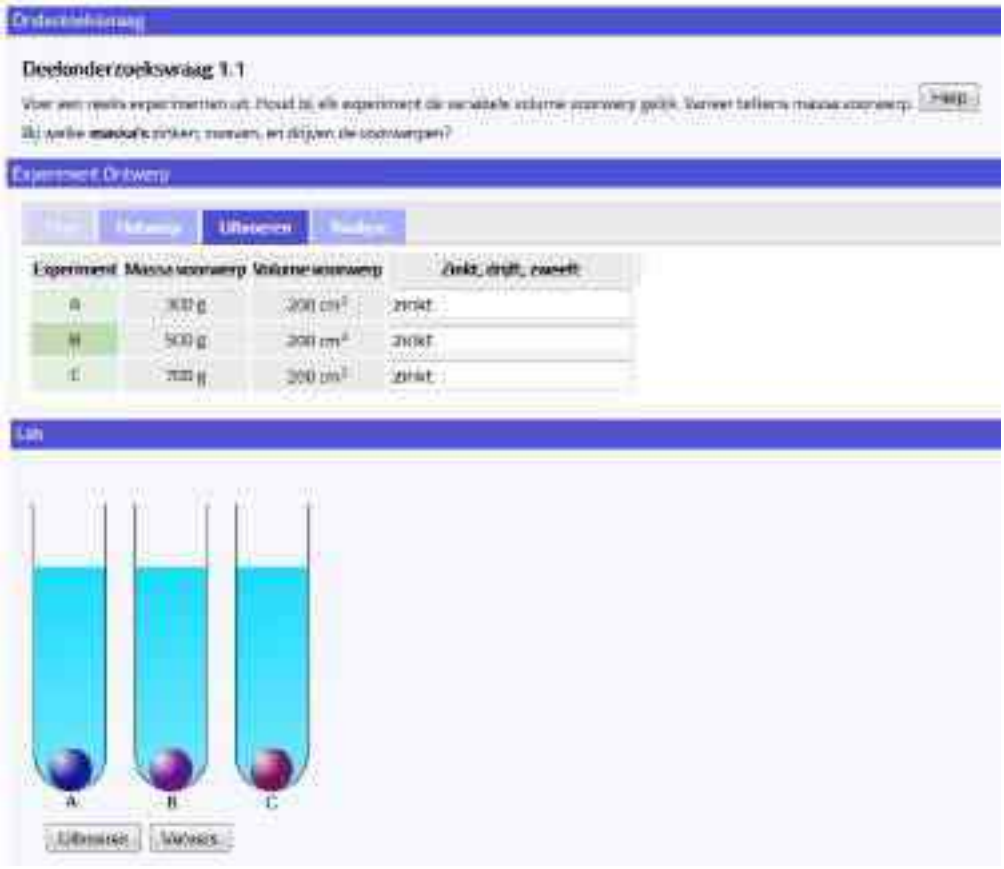
UT is the national coordinator of implementation in the Netherlands. It is also the lab provider/owner of several online virtual labs for inquiry teaching, such as Splash, Bond and Electricity labs. During Phase-B it organized 4 activities with 4 schools in the local area where 338 students participated. The focus was on physics and chemistry curriculum utilizing the Splash and Bond labs and the associated ILSs respectively.

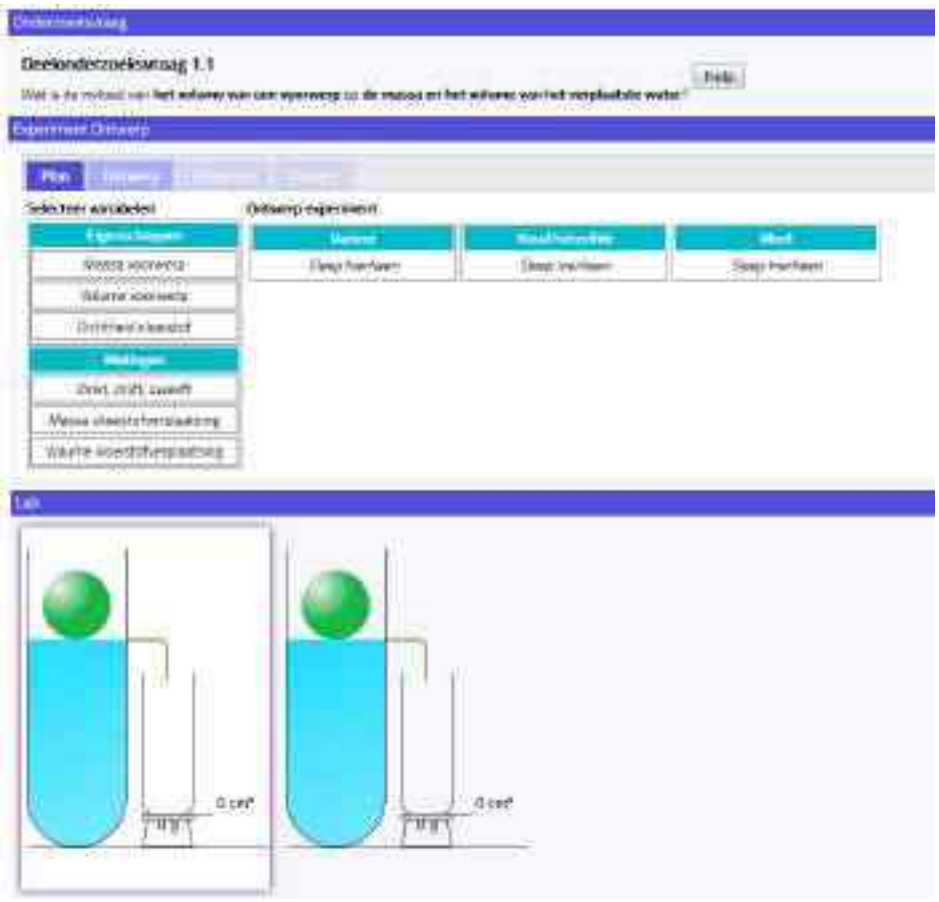
Date(s)	**Activity type**	**Participants (Schools)**	**Labs**	**Subject(s)**
17/11/2014 27/11/2014	Activity with students	220 (1)	Splash	Physics
15/12/2014	Activity with students	8 (1)	Bond	Chemistry
16/12/2014	Activity with students	80 (1)	Concept mapping	Physics
08/01/2015	Activity with students	30 (1)	Bond	Chemistry

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

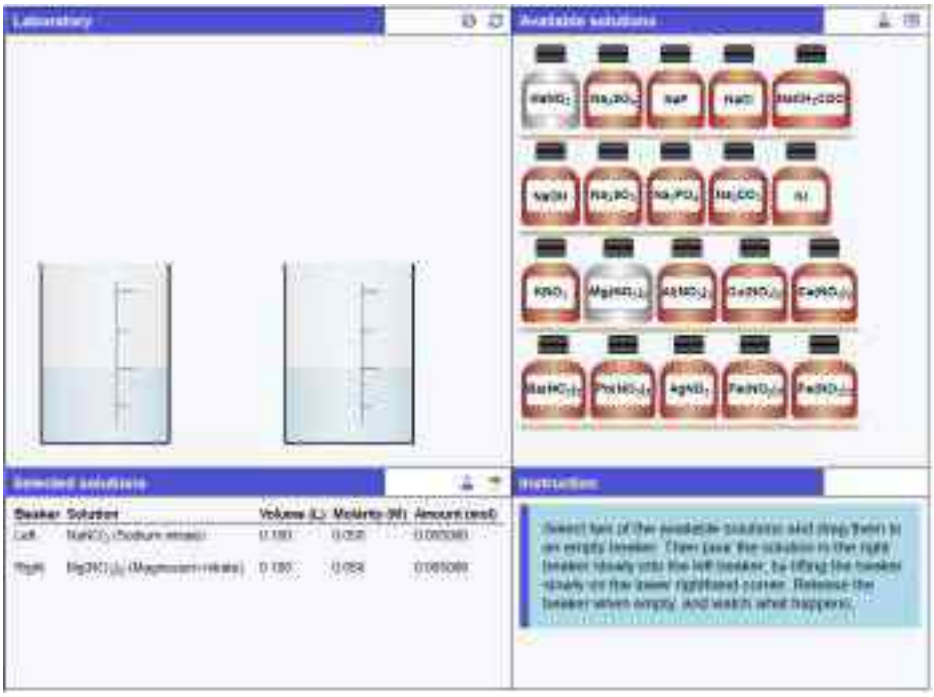
G O - L A B Report Code	[NL01-17112014]
Title	Scaffolding students' experiment design
Country City/Region	Hengelo
Working language	Dutch
Start/End Date	17-11-2014 / 27-11-2014
Partners Involved	UT
Coordinator name and email	Henny Leemkuil, h.h.leemkuil@utwente.nl
School Profile	Bataafs Lyceum is a school for the higher levels of secondary education.
Number and age of students	110 students of the first year (age 12-13) and 100 students from the third year (age 14-15)
Activity Description	Students used a set-up in which a research question was given in combination with the Experiment Design Tool and part of the Splash Lab. Groups differ in the type of research question and the set-up of the Lab
Implemented online labs	Splash
Learning outcomes	

Photos or other relevant material



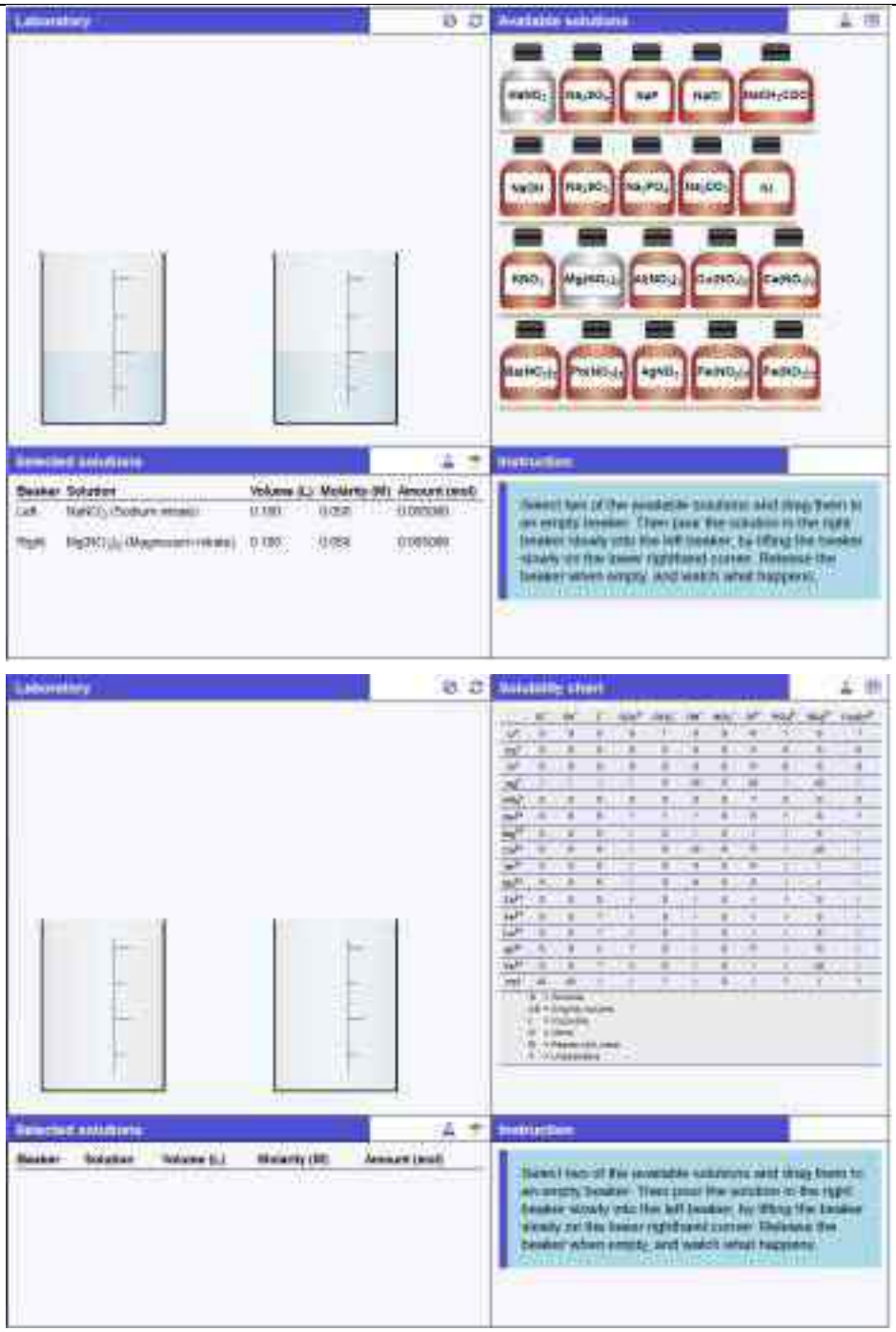


G O - L A B Report Code	[NL01-15122014]
Title	Usability of the Bond Lab (1)
Country City/Region	Groenlo
Working language	Dutch
Start/End Date	15-12-2014
Partners Involved	UT
Coordinator name and email	Henny Leemkuil, h.h.leemkuil@utwente.nl
School Profile	Marianum is a school for all levels of secondary education.
Number and age of students	8 students 14-16 years old
Activity Description	Students used the Bond Lab and ILS and filled in a questionnaire about its usability
Implemented online labs	Bond
Learning outcomes	
Photos or other relevant material	marianum scholengemeenschap


Laboratory
Available solutions
Selected solutions
Instruction
Beaker Solution Volume (L) Molarity (M) Amount (mol)

G O - L A B Report Code	[NL01-16122014]
Title	Bas' experiment
Country City/Region	The Netherlands, Lochem
Working language	Dutch
Start/End Date	16/12/2014
Partners Involved	UT
Coordinator name and email	Henny Leemkuil, h.h.leemkuil@utwente.nl
School Profile	Het Staring College is a public school for all levels of secondary education. One of the policies of the school is to prepare the students in the higher levels of education for a scientific study. They integrate Science orientation in all existing courses and stimulate the development of inquiry skills
Number and age of students	3 classes, about 80 students in total, 2th year, age 13-14
Activity Description	3 conditions. All students got a pretest on the subject. They then used the given ILSs. At the end the students got a posttest.
Implemented online labs	Concept mapping tool
Learning outcomes	
Photos or other relevant material	

G O - L A B Report Code	[NL01-08012015]
Title	Usability of the Bond Lab (2)
Country City/Region	Hengelo
Working language	Dutch
Start/End Date	08-01-2015
Partners Involved	UT
Coordinator name and email	Henny Leemkuil, h.h.leemkuil@utwente.nl
School Profile	Bataafs Lyceum is a school for the higher levels of secondary education.
Number and age of students	30 students 14-16 years old
Activity Description	Students used the Bond Lab and filled in a questionnaire about its usability
Implemented online labs	Bond
Learning outcomes	
Photos or other relevant material	Bataafs Lyceum Onderdeel van OSG Hengelo.


Laboratory
Available solutions
Selected solutions
Beaker Solution Volume (L) Molarity (M) Amount (mol)
Instruction
Laboratory
Solubility chart
Selected solutions
Beaker Solution Volume (L) Molarity (M) Amount (mol)
Instruction

4.8 Portugal

NUCLIO is the national coordinator of implementation in Portugal. During Phase-B it conducted a series of short/demo training workshops, in the framework of the Galileo Teachers Training Programme. It also organized a multi-hour long certified training programme around various areas of the country. In total 306 science teachers from 62 secondary schools attended the workshops focusing on physics and astronomy curricula. They utilized online labs such as SalsaJ, Sun4all, Faulkes remote telescopes, ESA archives, Impact calculator lab. The full list of events is shown in the table below.

Date(s)	**Type**	**Participants (Schools)**	**Labs**	**Subject(s)**
22/11/2014	Training of teachers	22 (9)	Impact calculator	Physics, Astronomy
24/11/2014 - 30/11/2014	Training of teachers	19 (19)	Salsa J, Sun4all, Faulkes Telescope	Physics, Astronomy
18/11/2014	Activity with students	30 (1)	Faulkes Telescope, ESA archives	Physics, Astronomy
02/10/2014 04/11/2014	Training of teachers	25 (2)	Salsa J, SOHO-ESA archives	Physics, Astronomy
02/10/2014 04/11/2014	Activity with students	480 (2)	Salsa J, SOHO-ESA archives	Physics, Astronomy
13/12/2014	Training of teachers	45 (10)	Impact calculator , Salsa J, Faulkes Telescope	Physics, Astronomy
27/09/2014 – 02/02/2015	Training of teachers	74 (4)	Salsa J, Sun4all, Faulkes Telescope	Physics, Astronomy
27/01/2015 – 10/04/2015	Training of teachers	121 (15)	Salsa J, SOHO-ESA archives	Physics, Astronomy

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

G O - L A B Event Code	PT1922112014
Title	Go-lab Pilot's Day – Vila Nova Gaia
Country City/Region	Portugal / Vila Nova Gaia
Working language	Portuguese
Start/End Date	22/11/2014
Organizing Institute	NUCLIO
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
Activity Form	Parque Biológico de Vila Nova de Gaia
Activity Type	Workshop
Total number of teachers/schools	22 teachers from 9 schools
Implemented online labs	Impact Calculator
Brief description	Pilot's Day activity to present new versions of the tools and discuss with teachers their questions, present new labs and apps
Learning outcomes	Teachers had the opportunity to use the new graasp and learn how to build their own ILS. A sample ILS was presented
Photos or other relevant material	

G O - L A B Event Code	PT1924112014
Title	Astronomy@my PC
Country City/Region	Portugal
Working language	English
Start/End Date	24/11/2014 – 30/11/2014
Organizing Institute	NUCLIO / ESA
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
Activity Form	International Training - Several school teachers from different countries Austria, Check Republic, Greece, Portugal, Malta, UK, Poland, Romenia, Spain, Italy, Estonia
Activity Type	Workshop
Total number of teachers/schools	19 teachers and 9 scientists
Implemented online labs	Salsa J, Sun4all, Faulkes Telescope. Other virtual labs are also presented (Stellarium, Celestia, Google Earth and WWT)
Brief description	This was the annual ESA/GTTP joint training session promoted in partnership with the ESA science directorate. Most of the teachers were teachers already involved in pilot implementation of Go-lab tools and resources. The programme contemplated science talks, talks addresseing IBSE, special session presenting Go-lab tools and resources, the construction of ILS
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 teaches to collaborate between subject areas, grade levels and and as far as possible using a contextualized approach
Website	https://www.facebook.com/media/set/?set=a.765736973440394.1073741852.128063420541089&type=3

Photos or other relevant material	   

G O - L A B Report Code	PT1901092014
Title	NUCLIO on the road – Demo activity
Country City/Region	Portugal / Cascais
Working language	Portuguese
Start/End Date	18/11/2014
Partners Involved	NUCLIO
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
School Profile	St. Julian's School
Number and age of students	30 students, 5 teachers
Activity Description	Demo activity for teachers and students
Implemented online labs	Faulkes Telescope. and ESA archives (The Rosetta Mission)
Learning outcomes	Students and teachers where introduced to the science behind the Rosetta Mission to sparkle their interest. The demo activity used ESA online animations that show the path of Rosetta Mission. Teachers were presented to the idea of introducing these tools in classroom via Go-lab platform. Impact calculator was presented as a demo. Black Holes and Telescopes where also discussed and presented as experiences that they can perform in classroom
Photos or other relevant material	

G O - L A B Report Code	PT1901102014
Title	NUCLIO on the road demo activity
Country City/Region	Portugal / Condeixa /Cascais
Working language	Portuguese
Start/End Date	02/10/2014 04/11/2014
Partners Involved	NUCLIO
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
School Profile	EBn.º 3 de Condeixa Colégio Sra Boa Nova
Number and age of students	4 teachers 60 students 21 teachers / 420 students
Activity Description	Demo activity at school promoting Go-lab concept
Implemented online labs	Salsa J, SOHO archives, Planetaria Software
Learning outcomes	Workshop for students – the purpose of this activity is to engage students in the use of modern tools for exploring scientific topics. Students were presented current topics of astronomy followed by a session with hands-on tools. Workshop for teachers — the aim of this activity is to inform teachers about projects promoting the use of modern tools for science teaching, the methodology involved in the project and to motivate them to take part actively.
Photos or other relevant material	https://www.facebook.com/media/set/?set=a.971756289508052.1073741897.130639500286406&type=3

G O - L A B Event Code	PT1913122014
Title	Go-lab Pilot's Day – Cascais
Country City/Region	Portugal/Cascais
Working language	Portuguese
Start/End Date	13/12/2014
Organizing Institute	NUCLIO /EPFL
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
Activity Form	Workshop at Centro de Interpretação Ambiental da Pedra do Sal
Activity Type	Training
Total number of teachers/schools	45 teachers from 10 schools
Implemented online labs	Impact Calculator, SalsaJ, Faulkes Telescope, graasp, related ILSs
Brief description	Pilot's Day activity to present new versions of the tools and discuss with teachers their questions, present new labs and apps.
Learning outcomes	Teachers had a hands-on session on graasp and the creation of ILS Teachers had the opportunity to use the new graasp and learn how to build their own ILS.
Photos or other relevant material	 

G O - L A B Event Code	PT1901092014
Title	Laboratórios Online para Astronomia
Country City/Region	Portugal Coimbra
Working language	Portuguese
Start/End Date	27/09/2014 – 14/10/2014 26/11/2014 - 03/12/2014 10/01/2015 - 02/02/2015
Organizing Institute	NUCLIO
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
Activity Form	Workshops at Escola Secundária de Palmela Escola Secundária Infanta D. Maria Escola Secundária D. Manuel Martins Escola Secundária Padre António Vieira
Activity Type	Certified Training Programme (25 hours in total)
Total number of teachers/schools	21 teachers 20 teachers 18 teachers 15 teachers
Implemented online labs	Salsa J, Sun4all, Faulkes Telescope. Other virtual labs are also presented (Stellarium, Celestia, Google Earth and WWT)
Brief 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 and the creation of ILS.
Learning outcomes	With this training the teachers are able to strengthen their knowledge in astronomy; they also get to learn ho two use the online lab resources of the project: "Global Online Science Learning Labs for Inquiry at School" (GO-LAB), including: remote telescopes (Faulkes Telescope), software analysis of astronomical data (SalsaJ and astrometric), database of real observations (pictures of the Sun's Sun4All); The teachers will also be able to use the methodology Inquiry Based Science Education (IBSE) and e-Learning platforms. Participants created their Graasp accounts and their own ILS

Website	https://www.facebook.com/media/set/?set=a.988306191186395.1073741900.130639500286406&type=1
Photos or other relevant material	     

G O - L A B Event Code	PT1901012015
Title	NUCLIO on the road demo activity
Country City/Region	Portugal / Mem Martins / Amarante / Marco de Canaveses / Águeda / Feijó / Vendas Novas / Cajutal / Sousel / Sta Maria da Feira / Tomar / Vila Nova de Gaia / Sta Maria da Feira / Porto
Working language	Portuguese
Start/End Date	27/01/2015 05/02/2015 10/02/2015 12/02/2015 24/02/2015 26/02/2015 27/02/2015 04/03/2015 06/03/2015 07/04/2015 08/04/2015 09/04/2015 09/04/2015 10/04/2015
Organizing Institute	NUCLIO
Coordinator name and email	Rosa Doran / rosa.doran@nuclio.pt
Activity Form	Escola D. Afonso V Centro Escolar Auracária Escola Secundária de Marco de Canaveses Escola Secundária de Marques de Castilho Escola Secundária Romeu Correia Agrupamento de Escolas de Vendas Novas Escola Secundária Adolfo Portela Escola Básica do Catujal Escola Padre Joaquim Maria Fernandes Colégio Liceal de Santa Maria de Lamas Escola Secundária Jacome Ratton Escola Básica Adriano Correia de Oliveira Escola Básica e Secundária Rodrigues de Freitas Agrupamento de Escolas de Vilela Colégio D. Dinis I
Activity Type	Demonstration and short training
Total number of teachers/schools	**3 teachers / 5 teachers / 10 teachers / 5 teachers / 6 teachers /** **6 teachers / 18 teachers / 14 teachers / 6 teachers / 12 teachers /** **5 teachers / 12 teachers / 6 teachers / 8 teachers / 5 teachers**
Implemented online labs	Salsa J, SOHO archives, Planetaria Software

Brief description	Demo activity at school promoting Go-lab concept
Learning outcomes	Workshop for teachers — the aim of this activity is to inform teachers about projects promoting the use of modern tools for science teaching, the methodology involved in the project and to motivate them to take part actively. Teachers are invited to navigate on the Go-Lab portal, create an account on Graasp and explore the different tools and labs. An example ILS is present and the creation of new ILS demonstrated. NUCLIO on the road demo activity
Photos or other relevant material	










4.9 Spain

UDEUSTO is the national coordinator of implementation in Spain. It is also the lab provider/owner of remote labs such as Boole, Archimedes and Aquarium. During Phase-B it organised 4 training workshops at national and local level for science teachers. In addition to them 3 more workshops were organized in the past and are included here because accidentally they were not reported in deliverable D7.3. In total there were 147 participants from 92 schools. They practiced various virtual and remote labs including VISIR, Electricity, Boole, Archimedes, Splash and associated ILSs for teaching physics, electronics and technology.

Date(s)	**Type**	**Participants (Schools)**	**Labs**	**Subject(s)**
19/02/2014	Training of teachers	23 (10)	Boole	Physics, Electronics, Technology
24/04/2014	Training of teachers	19 (12)	Electricity lab, VISIR, Boole	Physics, Electronics, Technology
21/05/2014	Training of teachers	10 (5)	VISIR, Boole	Physics, Electronics, Technology
05/02/2015	Training of teachers	29 (20)	Electricity lab, VISIR, Boole, Splash lab	Physics, Electronics, Technology
25/06/2015	Training of teachers	40 (25)	Electricity, VISIR, Archimedes, Splash	Physics, Electronics, Technology
17/06/2015 09/07/2015	Training of teachers	16 (10) 10 (10)	VISIR, Archimedes, Splash	Physics, Electronics, Technology

G O - L A B Event Code	ES12-19022014
Title	Go-Lab Inquiry Learning Space: ILS for Technology and Digital Electronics. Evaluation
Country City/Region	Bilbao, Spain
Working language	Spanish/English
Start/End Date	19/02/14
Organizing Institute	Ellinogermaniki Agogi Scholi Panagea Savva AE, University of Deusto and Berritzegune
Coordinator name and email	Javier García-Zubía – zubia@deusto.es Eleftheria Tsourlidaki - Eleftheria@ea.gr
Activity Form	Training workshop
Activity Type	Local
Total number of teachers/schools	23 participant teachers from 10 secondary schools
Implemented online labs	WebLab-Boole-Deusto remote lab for digital electronics and technology
Brief description	The duration of the workshop was 2 hours. 25 teachers were signed up and 23 finally attended the workshop The workshop was divided in three parts: - Description of the GoLab project: goals, website, contest and implementation. - Description of the ILS for digital electronics: how tom design a digital system using the WebLab-Deusto-FPGA online lab. - Description of the scaffolds: concept mapper, hypothesis scratchpad. - Discussion and reflection using a survey. The results of the survey can be found at the end of this report.
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 an ILS and the usefulness of guidance tools as a mean of support.
Website	n/a

Photos or other relevant material	  
Event agenda	• GoLab description • Use of ILS for digital electronics • Questionnaire

G O - L A B Event Code	ES12-24042014
Title	Go-Lab Inquiry Learning Space: ILS for Technology and Physics
Country City/Region	La Coruña, Spain
Working language	Spanish
Start/End Date	24/04/14
Organizing Institute	University of Deusto and Domus Science Museum
Coordinator name and email	Javier García-Zubía – zubia@deusto.es
Activity Form	Workshop
Activity Type	Local activities: ILS workshop
Total number of teachers/schools	23 participants: 19 teachers from 12 schools and 4 museum technicians
Implemented online labs	Electric Circuit Virtual Lab VISIR remote lab for analog electronics and physics WebLab-Boole-Deusto remote lab for digital electronics and technology
Brief description	The duration of the workshop was 2,5 hours. 24 teachers and museum technicians were enrolled and 23 finally attended the workshop (19 teachers + 4 museum technicians). The workshop was divided in three parts: - Description of the GoLab project: goals, web sites, contest and implementation. - 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. - Discussion and reflection using a survey.
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 an ILS and the usefulness of guidance tools as a mean of support.
Website	

Photos or other relevant material	    
Event agenda	• GoLab description • Workshop • Questionnaire

G O - L A B Event Code	ES12-21052014
Title	Go-Lab Inquiry Learning Space: ILS for Technology and Physics
Country City/Region	ONLINE, Spain
Working language	Spanish
Start/End Date	21/05/14
Organizing Institute	University of Deusto
Coordinator name and email	Javier García-Zubía – zubia@deusto.es, Olga Dziabenko – olga.dziabenko@deusto.es
Activity Form	Workshop
Activity Type	National activity
Total number of teachers/schools	10 teachers from 5 secondary and high schools
Implemented online labs	VISIR remote lab for analog electronics and physics Boole-Deusto experiments in frame of WebLab-Deusto remote lab for digital electronics and technology
Brief description	One week before the 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 online workshop was 50 mins. 10 teachers were enrolled and participated in this workshop. The survey/ questionnaires was not organized The workshop includes:: - Presentation didactic structure of ILS and inquiry–based circle - Presentation of ILS “From the gate level to the digital circuit” deployed in graasp. - 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. - Visiting golabz.eu and discovering new online labs.
Learning outcomes	The goals of this workshop were to present teachers Go-Lab platform, and ILS grasp spaces, the use of on-line labs through the ILSs and the usefulness of guidance tools as a mean of support.

Website	https://eu1.bbcollab.com/m.jnlp?sid=2013060&password=M.982AF9759A3393E29BB66BC4F477BB
Photos or other relevant material	
Event agenda	Programa (in Spanish) 17:00 Estructura didàctica d'una ILS 17:25 Altres ILS i laboratoris de GoLab. http://www.golabz.eu 17:30 Sessió amb ILS d'electrònica digital. 17:40 Sessió amb ILS d'electrònica analògica i física. 17:50 Recomanacions per al projecte GoLab: avantatges per al professorat i el centre educatiu / Questionnaire

G O - L A B Event Code	ES12-05022015
Title	Go-Lab Inquiry Learning Space: ILS for Technology and Physics
Country City/Region	Spain, Barcelona
Working language	Spanish
Start/End Date	05/02/15 – 06/02/15
Organizing Institute	University of Deusto and CESIRE: Department of Education of the Catalonian Government
Coordinator name and email	Javier García-Zubía – zubia@deusto.es
Activity Form	Training workshop
Activity Type	National activity
Total number of teachers/schools	29 science teachers from 20 high schools
Implemented online labs	VISIR remote lab for analog electronics and physics Boole-Deusto experiments in frame of WebLab-Deusto remote lab for digital electronics and technology, concept mapper, hypothesis scratchpad, Splash lab, Electricity lab
Brief description	The objective of the Workshop is developing the ILS concept using the Go-Lab tools: apps, labs, examples of other scenarios, etc. and integrating it using Go-Lab portal golabz.eu for further implementation in class instruction. On the second day, Feb. 6, 2015, after the design experience the attendants were invited to highlight and discuss the pros and cons of the Go-Lab instruments and methodology.
Learning outcomes	The goals of this workshop were teachers to get familiar with the Go-Lab platform, and ILS grasp spaces, the use of on-line labs through the ILSs and the usefulness of guidance tools as a mean of support of teaching.
Website	The CESIRE used its own Moodle System

Photos or other relevant material	    
Event agenda	First day: February 5th The GoLab portals: Golabz, Graasp, and Go-Lab-Project Review of apps and labs Video tutorials of the ILS Guided design of an ILS Second day: February 6th Design of a personal ILS Analysis of the Go-Lab tools and methodology Explanation of Summer School contest (invitation, deadline, website, etc.)

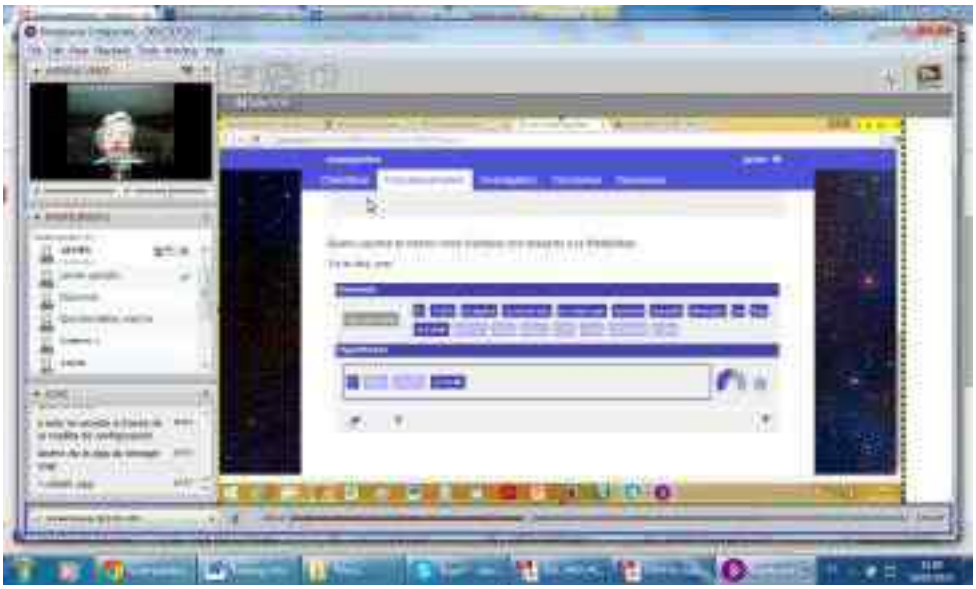
G O - L A B Event Code	ES12-25062015
Title	Go-Lab Inquiry Learning Space
Country City/Region	Madrid, Spain
Working language	Spanish
Start/End Date	25/06/15
Organizing Institute	UNED and University of Deusto
Coordinator name and email	Salvador Ros (UNED), Manuel Castro (UNED), and Javier García-Zubía (UDeusto) – zubia@deusto.es
Activity Form	Visionary and Short Training Workshop
Activity Type	Local activities: Visionary Workshop
Total number of teachers/schools	40 science teachers from 25 secondary schools
Implemented online labs	Electric Circuit Lab – the virtual laboratory; VISIR – the remote lab for analog electronics and physics; Archimedes Lab - the remote lab for an investigation of Archimedes principles; Splash Lab – the virtual lab for exploring the buoyancy force;
Brief description	The duration of the workshop was 2,5 hours. 40 teachers of the Gredos San Diego (GSD) network of schools attended the workshop The workshop was divided in three parts: - Description of the Go-Lab project: goals, web sites, contest and implementation. Go-Lab project for teachers, students and parents. - Results of Go-Lab Spain: Julieta Jiménez de Llano experience. - How to join the Go-Lab Project. Fill the survey. The teachers got overview of the Go-Lab tools such as Online laboratories, Apps, ILSs. The authorization environment (graasp.eu), tutoring platform and support space where presented. The discussion about the possibility to use this instrument in class framework was performed.
Learning outcomes	The goals of this workshop were to gather information about teachers' first impression of the Go-Lab platform, the use of online labs through an ILS and the usefulness of guidance tools as a mean of support.

Website	http://www.gredossandiego.com/noticias.aspx?id=99
Photos or other relevant material	  
Event agenda	Session (25/06/2015) • Description of the GoLab project: goals, web sites, contest and implementation. • Go-Lab project for teachers, students and parents. • Results of Go-Lab Spain • Julieta Jiménez de Llano experience. • How to join the Go-Lab Project. Fill the survey.

G O - L A B Event Code	ES12-17062015
Title	Go-Lab: project, approach and innovation in class instructions
Country City/Region	ONLINE, Spain
Working language	Spanish
Start/End Date	17/06/2015
Organizing Institute	University of Deusto
Coordinator name and email	Javier García-Zubía – zubia@deusto.es, Iratxe Mentxaka Sierra - iratxe.mentxaka@deusto.es
Activity Form	Online Workshop
Activity Type	National activity: virtual workshop
Total number of teachers/schools	16 teachers of secondary and high schools
Implemented online labs	Archimedes Lab - the remote lab for an investigation of Archimedes principles; Splash Lab – the virtual lab for exploring the buoyancy force; VISIR – the remote lab for analog electronics and physics;
Brief description	The duration of the online workshop was 2 hours. It is first online workshop in frame of the Pilot C, where 16 teachers were enrolled and participated. The workshop was divided in three parts: - Description of the Go-Lab project: goals, web sites, contest and implementation. Go-Lab project for teachers, students and parents. - Results of Go-Lab Spain: Julieta Jiménez de Llano experience. - How to join the Go-Lab Project. Answers on the teachers questions
Learning outcomes	The goals of this workshop were to present Go-Lab to the participant and introduce them the inquiry approach integrated in this project.
Website	https://eu1.bbcollab.com/site/external/jwsdetect/playback.jnlp?psid=2015-06-17.1204.M.30A09B856BD57B635181C016E33748.vcr&sid=2013060

Photos or other relevant material	
Event agenda	• Presentation of the Go-Lab project: http://www.go-lab-project.eu/ Description of the project: goals, web sites, contest and implementation. • Go-Lab project for teachers, students and parents. • Results of Go-Lab Spain • How to join the Go-Lab Project. • Answers/Questions

G O - L A B Event Code	ES12- 09072015
Title	Go-Lab: project, approach and innovation in class instructions
Country City/Region	ONLINE, Spain
Working language	Spanish
Start/End Date	09/07/2015
Organizing Institute	University of Deusto
Coordinator name and email	Javier García-Zubía – zubia@deusto.es, Iratxe Mentxaka Sierra - iratxe.mentxaka@deusto.es
Activity Form	Online Workshop
Activity Type	National activity: virtual workshop
Total number of teachers/schools	10 teachers from 10 schools of the network GSD (Gredos San Diego)
Implemented online labs	Archimedes Lab - the remote lab for an investigation of Archimedes principles; Splash Lab – the virtual lab for exploring the buoyancy force;
Brief description	The duration of the online workshop was 2 hours. The main activity was to train the teachers to develop own ILS using the authorization tool (graasp.eu) and Go-Lab repository's items such as APPs (hypothesis, concept map, etc) and online laboratories.
Learning outcomes	The goals of this workshop were to present Go-Lab authorization tool to the participant and present them 5 phases of the IBL approach.
Website	https://eu1.bbcollab.com/site/external/jwsdetect/playback.jnlp?psid=2015-07-09.0946.M.30A09B856BD57B635181C016E33748.vcr&sid=2013060
Photos or other relevant material	

	 
Event agenda	• Presentation of the Go-Lab authorization tool – graasp.eu: registration, login, create, edit, delete ILS • Usage the Go-Lab repository: Apps, Online Labs • Integration Apps and Online Lab into ILS. Its adaptation to the subject and language. • Answers/Questions

4.10 UK

CU is the national coordinator of implementation in UK and provider of Faulkes Telescope remote lab. As partner participated and contributed in activities organised by other partners (NUCLIO, EA, ESA) focusing on physics and astronomy. In collaboration with NUCLIO and EA they conducted an international training for 15 science teachers from UK, Austria and Portugal where the use of online labs was introduced and practiced. The focus was on astronomy and physics. Also with respect to activities in UK schools ULEIC organized a series of interventions as part of work-package 3, participatory design with teachers and students. These activities are reported in D3.3 and in order to avoid double-counting they are not included in this document.

G O - L A B Event Code	UK20-130415
Title	Hands On Astronomy, Cardiff University, Cardiff
Country City/Region	UK with support from Portugal (Nuclio), Greece (EA)
Working language	English
Start/End Date	13/04/2015 to 17/04/2015
Organizing Institute	Faulkes Telescope Project / Cardiff University
Coordinator name and email	Fraser Lewis (fraser.lewis68@gmail.com) Chris North (chris.north@astro.cf.ac.uk)
Activity Form	Workshop
Activity Type	International (attendees from UK, Portugal, Austria)
Total number of teachers/schools	15 teachers from 8 schools
Implemented online labs	Faulkes remote telescopes, Impact calculator
Brief description	This event was developed as a co-operation between Cardiff University, National Schools' Observatory and the Faulkes Telescope Project (then USW partner 17 in Go-Lab, now Cardiff partner 20). In conjunction with Rosa Doran (Nuclio), a schedule was developed and teachers were funded through both Erasmus + and UK teacher training funds (NSO and Techniquest). Teachers were taken through a range of activities based around astronomy from Solar System out to Cosmology, with the emphasis always being on practical skills and activities. On the final day, a trip to Stonehenge was arranged. The target audience was really teachers with an interest in astronomy whether they were teaching astronomy, physics or general science. Those who had an interest in the EU projects were especially welcome, but attendance was not limited to these groups. The event was not specifically targeted to teachers of a particular age range of students, but topics included were of more relevance to those in late secondary education. The objectives were to encourage a two-way discussion between teachers and those that provide resources for teachers and to demonstrate the online resources currently available via online portals such as Go-Lab.

Learning outcomes	Teachers were presented with a range of activities and resources, many of which follow the IBSE format. Those that were new to the online portals were introduced to them and registered for Graasp The discussion with Eleftheria Tsourladiki (EA) provided an insight into the Big Ideas of Science. All UK participants were required to share their experiences in a further hour-long Skype meeting to demonstrate their understanding of the topics and how the introduction to Go-Lab, IBSE had improved their teaching.
Website	http://blogs.cardiff.ac.uk/physicsoutreach/inspiring-science-education/hands-on-astronomy-teacher-conference/ See also http://www.faulkes-telescope.com/news/2568
Photos or other relevant material	See http://www.faulkes-telescope.com/news/2568
Event agenda	

Tuesday 14th April

Title	Duration	Start time	End time	Presenter(s)	Venue
NAAP Labs	0:30	10:00	10:30	PJ/SB/SGR	WX3.07
PT observations	0:45	10:30	11:15	PR/SGR/PL	WX3.07
Break	0:30	11:15	11:45		WX3.14
NSO observations	0:45	11:45	12:30	CL/PL	WX3.07
Lunch	1:00	12:30	13:30	(Deedon Lab)	
Dry ice comets	0:30	13:30	14:00	PR	Lab
Astro Cymru 3D show	0:30	14:00	14:30	BW	WX3.07
Break	0:30	14:30	15:00		WX3.14
Museum & Down to Earth	2:00	15:00	17:00	JH	NMW

Title	Duration	Start time	End time	Presenter(s)	Venue
Arrival & Registration		9:30	10:00		WX3.14
Welcome and introductions	0:30	10:00	10:30	CN	WX3.07
Open Science Resources	1:00	10:30	11:30	RD	WX3.07
Break	0:30	11:30	12:00		WX3.14
Space Scoop	1:00	12:00	13:00	BER	WX3.07
Lunch	1:00	13:00	14:00	(Deedon Lab)	
Exoplanet Activities	1:00	14:00	15:00	ED	WX3.07
Break	0:30	15:00	15:30		WX3.14
Space in the Classroom	0:45	15:30	16:15	PH	WX3.07
Current					

Wednesday 15th April

Title	Duration	Start time	End time	Presenter(s)	Venue
Welcome and introductions	0:15	10:00	10:15	CN	WX3.07
Star in a Box	1:30	10:15	11:45	CN	WX3.07
Break	0:30	11:45	12:15		WX3.14
Multiwavelength Universe	0:30	12:15	12:45	HG/CN	WX3.07
Lunch	1:00	12:45	13:45	(Deedon/Spencer Lab)	Refectory
ISE Scenarios	1:00	13:45	14:45	CN	WX3.07
Gaia	1:00	14:45	15:45	MF	WX3.07
Break	0:30	15:45	16:15		WX3.14
Galaxy Zoo Navigate	1:00	16:15	17:15	JD	WX3.07
Cosmology	0:00	17:15	17:15	CN	WX3.07

Thursday 16th April

Title	Duration	Start time	End time	Presenter(s)	Venue
Using Logger Pro	1:00	10:00	11:00	VE	WX3.07
Break	0:30	11:00	11:30		WX3.14
Open Science Resources	1:00	11:30	12:30	RD	WX3.07
Lunch	1:00	12:30	13:30	(Upper Lab)	Refectory
Big Ideas of Science	1:30	13:30	15:00	ET/PL	WX3.07
Action Plans	0:45	15:00	15:45	CN	WX3.07
Break	0:30	15:45	16:15		WX3.14
NSO & FT	0:45	16:15	17:00	PL/CL	WX3.07

4.11 Switzerland

CERN and EPFL conducted and coordinated the implementation activities in Switzerland. 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 organizes training activities for science teachers in the framework of its established High-school Teachers Training summer programme. CERN is also developing an online remote lab ("Cloud chamber") and related ILSs to be used by teachers and students in the coming school year and in Phase-C. The teacher and student trainings in CERN in general comprise hands-on workshops with labs such as Cernland, LHCgame, Hypatia, Minerva, iSpyCMS, with a focus on particle physics research and technology.

EPFL is the owner and developer of Graasp, the authoring environment of Go-Lab. In Phase-B EPFL organized series of training workshops for science teachers in a local school and in-classroom studies of the developed ILSs. The reports of these activities are included below.

Date(s)	Type	Participants (Schools)	Labs	Subject(s)
14/10/2014 08/12/2014 03/02/2015 12/03/2015 22/04/2015	Training of teachers	4 (1)	Splash, Gearsketch, Sun4all, Faulkes Telescope, Geogebra, Impact calculator	Physics, Astronomy, Technology
06/02/2015 17/02/2015 10/03/2015 13/03/2015	Activity with students	7 (1) 11 (1) 15 (1) 16 (1)	Splash, Gearsketch, Sun4all, Faulkes Telescope, Geogebra, Impact calculator	Physics, Astronomy, Technology

G O - L A B Report Code	CH03-01/03/2015
Title	Teachers Training Programme
Country/City/Region	Switzerland, Geneva
Working language	English and French
Start/End Date	14/10/2014, 8/12/2014, 3/2/2015, 12/3/2015, 22/4/2015
Organizing Institute	EPFL
Coordinator name and email	Adrian Holtzer
Activity description	Teacher Training
Activity Type	Local
Total number of teachers and schools	4 teachers from 1 school
Implemented online labs	Teachers develop their own ILSs with a variety of labs
Brief description	A series of 2-hour long trainings and hands-on practicing. Participants were introduced into Go-lab approach, inquiry methodologies, tools and activities through which online labs and apps be utilized effectively into the school classroom and school lab.
Photos	

G O - L A B Report Code	CH03-01/04/2015
Title	Teachers Training Programme
Country City/Region	Switzerland, Geneva
Working language	English and French
Start/End Date	6/2/2015, 17/2/2015, 10/3/2015, 13/3/2015
Partners Involved	EPFL
Coordinator name and email	Adrian Holtzer
School Profile	High school in Geneva City
Number and age of students	4 classes of 7, 11, 15, 16 students each (16-18 years old)
Activity Description	The teachers of the school participated in a series of trainings (see previous report) and they developed lesson plans and ILSs which then they used for their in-classroom teaching.
Implemented online labs	ILSs with a variety of labs and apps
Learning outcomes	Students familiarized themselves with Golab environment and approach. They practiced inquiry learning through online labs and support apps. They also compared their experience with everyday conventional teaching and learning.
Photos or other relevant material	

5 Summary of Results

Implementation Phase-B covered the period from project month 25 to month 33, which corresponds to 1 Nov 2014 – 31 Jul 2015. During that 9-month period partners organized and conducted 80 implementation activities around the host countries. Of which, 35 were training workshops for teachers with 794 participants from 340 schools and 45 were activities with students with 1834 participants from 80 schools. The total summative results after Phase A and B are: 1184 teachers from 689 schools attended the training workshops that partners organized; 2394 students from 117 schools participated in the activities that partners organized. The contribution per national coordinator and country is as follows:

Austria: CUAS conducted and coordinated 3 implementation activities with students from 5 secondary schools in Austria with about 80 participants. The Radioactivity, Electricity, Splash and VISIR labs and related ILSs were introduced and practiced. The subject domains of these activities and labs focused on physics and technology/informatics.

Belgium: EUN conducted and coordinated the implementation activities in Belgium, and also in Italy, Poland and other countries through online means. As EUN has a European status, rather than a national one, 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, one of which in collaboration with NUCLIO as a workshop in the Scientix annual conference. In total 85 participants/teachers joined the training workshops where a variety of labs were introduced and practiced. The subject domains of these activities and labs were focused mainly on physics/astronomy and chemistry.

Cyprus: UCY conducted and coordinated 15 implementation activities in Cyprus. The UCY team offered to schools a good balance of onsite training and support for the educational activities with students. Four onsite training activities for science teachers were organized, with 64 participants, where a variety of labs and related ILSs were introduced and practiced. The subject domains of these activities and labs focused on physics and also on technology, chemistry, maths, biology. The UCY team also organized 11 in-school activities with students where in total 178 students from 9 schools attended them and used the developed ILSs.

Estonia: UTE conducted and coordinated the implementation activities in Estonia that are listed in the following table. Four activities for science classrooms were organized, with 208 participant students, where the Splash and Guppies labs were introduced and practiced along with their accompanying ILSs which are translated in Estonian. The subject domains of these activities and labs focused on physics and biology.

Germany: During Phase-B UDE conducted and coordinated 6 implementation activities. In the training activities for science teachers that were organized, there were 54 participants from 24 schools, where the Osmosis and Electricity labs were presented and practiced along with their fully developed ILSs in German. The subject domains of these activities and labs focused on physics, chemistry and technology.

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-B there were 3 major teacher training events, one of which at

international level, with 100 participants, and 13 activities with students, with 471 participants from 54 schools. A large variety of subjects and labs were used (e.g. ESA-SOHO dataset, SalsaJ, Geogebra, Radioactivity, Gearsketch, Balancing Act PhET, Splash, PhET Buoyancy Density, HYPATIA, iSpyCMS), covering curriculum subjects from physics, astronomy, biology, maths, engineering and technology. Phase-B concluded with the Go-Lab Summer School, organized by EA in Marathon on 12-17 Jul 2015, in collaboration with partners of the consortium. The summer school was a week-long intensive course on the use of online labs is science education. 28 teachers from 15 countries around Europe participated and developed cross-thematic ILSs on various curriculum topics using in full the Go-Lab approach and repository of labs and tools.

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, Bond and Electricity labs. During Phase-B it organized 4 activities with 4 schools in the local area where 338 students participated. The focus was on physics and chemistry curriculum utilizing the Splash and Bond labs and the associated ILSs respectively.

Portugal: NUCLIO is the national coordinator of implementation in Portugal. During Phase-B it conducted a series of short/demo training workshops, in the framework of the Galileo Teachers Training Programme. It also organized a multi-hour long certified training programme around various areas of the country. In total 306 science teachers from 62 secondary schools attended the workshops focusing on physics and astronomy curricula. They utilized online labs such as SalsaJ, Sun4all, Faulkes remote telescopes, ESA archives, Impact calculator lab.

Spain: UDEUSTO is the national coordinator of implementation in Spain. It is also the lab provider/owner of remote labs such as Boole, Archimedes and Aquarium. During Phase-B it organised 4 training workshops at national and local level for science teachers. In addition to them 3 more workshops were organized in the past and are included here because accidentally they were not reported in deliverable D7.3. In total there were 147 participants from 92 schools. They practiced various virtual and remote labs including VISIR, Electricity, Boole, Archimedes, Splash and associated ILSs for teaching physics, electronics and technology.

Switzerland: CERN and EPFL conducted and coordinated the implementation activities in Switzerland. 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 organizes training activities for science teachers in the framework of its established High-school Teachers Training summer programme. CERN is also developing an online remote lab ("Cloud chamber") and related ILSs to be used by teachers and students in the coming school year and in Phase-C. The teacher and student trainings in CERN in general comprise hands-on workshops with labs such as Cernland, LHCgame, Hypatia, Minerva, iSpyCMS, with a focus on particle physics research and technology. EPFL is the owner and developer of Graasp, the authoring environment of Go-Lab. In Phase-B EPFL organized a series of training workshops for science teachers in a local school and in-classroom studies of the developed ILSs.

The full list of activities are shown in Table 1 which tabulates the main details of each event/activity, namely country, partners involved, dates, type of activity, participant teachers or students, online labs practiced and subject domains. Table 2 shows the summative numbers of participant schools, teachers and students per partner country for Phase B and the current overall totals after Phases A and B. These figures are also presented graphically in Graphs 1, 2, 3 and 4. In particular, Graph1 shows the number of teachers that participated in Go-Lab trainings per partner country in Phase A, in Phase B and in total. Graph 2 shows the number of schools involved in Go-Lab teacher trainings per partner country in Phase A, in Phase B and in total. Graph 3 depicts the number of students participated in Go-Lab activities organized by partners per country in Phase A, in Phase B and in total. Graph 4 depicts the number of schools involved in Go-Lab activities with students organized by partners per country in Phase A, in Phase B and in total.

As can be seen from the detailed reports, the tables and the graphs there is large variation on country per country level. This still holds after taking into account the difference in allocated person-months per partner to conduct activities with schools, teachers and students. The variation of achieved results is because of several factors, among others the flexibility of the educational system in introducing innovative methods and practices, the ICT infrastructure in schools, the attitudes, skills and interests of teachers. The most crucial one is being the culture and attitude of teachers, and in general the education system as a whole, across different countries and how flexible or prone they are in adopting inquiry teaching and learning approaches, the use of online labs in science education etc. In this context in Greece, Spain, Portugal, Cyprus, Estonia, the Netherlands, better overall results are achieved compared to Austria, Germany, UK, Switzerland.

Furthermore we observe that in most countries and cases there is large expression of interest from schools and teachers to join the project and attend the trainings. However they then find difficult to fully apply what they learned in their everyday teaching practice. As a result the national coordinators and partners devoted significant effort to organize and conduct themselves in-school activities with students. Being in close collaboration and interaction with the teachers and their schools they identified certain areas of barriers in applying the Go-Lab approach. Their general findings are:

- Teachers' overall attitude towards inquiry-based teaching is very positive. They find it beneficial for their students and seek every opportunity to apply and implement it as teaching and learning methodology. However in the majority of cases it is difficult to actually fully implement it due to time and curriculum constraints. This is a barrier that is usual in most countries with long list of curriculum subjects that should be covered within tight time-schedules. Their belief is that this barrier is very difficult to overcome at school or teacher level without overall reforms of the school curriculum and in general the secondary education system.
- Teachers usually express concerns and complains that the ICT infrastructure of their schools (both in terms of hardware and software, i.e. PC's operating system, installed browsers, screen resolutions, internet connection, security settings, available network speed etc) is neither sufficient nor adequate and in many cases outdated. This is a major technical barrier that holds back the use of online labs and in general the use of online educational resources in their classroom teaching.

- Further to the aforementioned, they find that the ratio of available internet connected PC's per student is low. A common ratio is as low as 1 PC per 10 students or 1 per 20, in less technologically advanced countries, or at best 1 in 5 in the most advanced ones. In school practice this means that there is only one PC or laptop equipped classroom. And this is primarily used for the teaching of informatics curriculum. As a consequence teachers need to book well in advance this special classroom in order to use it for science teaching. In many cases it is hard and bureaucratic to ask it from the school administration or alter its time-schedule.
- Due to these reasons teachers often try to find shortcut solutions. For example in many cases they prefer not to use inquiry lessons and related ILSs with whole classrooms of twenty or more students but only working with small group of students using smaller number of PCs. In this way they feel more confident and in control in case something goes wrong and in need of providing support. In addition they consume less network bandwidth since in many cases the available school network is marginal for the system to run properly. Also in order to cut time and make an ILS shorter in order to fit within the classroom time they may ask students to skip an introductory phase or split an ILS in consecutive lessons of online and traditional offline sessions. These are reflected in the usage of the system. From the analysis of its logging for example there are thousands of short ILS sessions, estimated about 250 classroom sessions with low threshold criteria and about 100 sessions with high threshold criteria e.g. more than 20 student logins following all 5 inquiry phases.
- Teachers, especially those who joined the project already from Phase A, are much more satisfied with the new version of the Go-Lab system with an authoring environment with upgraded functionality and user interface and the online repository enriched with larger variety of labs and subject domains. This is reflected in the fact that teachers have now created about 1100 user accounts in Graasp and they have fully developed more than 270 ILSs, 170 of which are already published in golabz.eu and the rest will also be in the coming period or is being migrated from the old system. In terms of primary subject domain 52% is in physics, 12% in chemistry, 11% in earth sciences, 8% in biology, 7% in astronomy and 3% in maths. In terms of language written, 39% is in English, 24% in Portuguese, 12% in Greek, 7% in Spanish, 4% in Estonian, 3% in Dutch.

Regarding the online labs that partners demonstrated and introduced to schools, teachers and students during Phase B these were the following (listed alphabetically per category):

Simulations/virtual labs: Bond, Build an atom, Electricity lab, Fishbowl Guppies, Gearsketch, Geogebra, Impact calculator, PhET-Buoyancy, PhET-Density, PhET-Balancing act, pH scale, Splash, Star in a box,

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

Remote labs: Archimedes, Boole, Faulkes-Telescope, Radioactivity, VISIR

The activities with teachers and students that practiced and utilized these online labs and related ILSs were linked to various science curriculum domains and in particular to Physics, Astronomy, Technology/Informatics/Electronics, Chemistry, Biology and Maths. Their classification in terms of subject domain is shown in Graphs 5 and 6, for teacher

trainings and activities with students, respectively. The grand majority is on Physics (92% and 98%) and Astronomy (55% and 33%) followed by Technology/Electronics (31% and 10%), Chemistry (18% and 2%), Biology (8% and 12%) and Maths (6% and 2%). This fact is explained by the expertise and experience of the partners involved and also to some extent the schools' and teachers' preferences and demands. Also it should be noted that since Phase A the Go-Lab repository have included considerably more online labs on Chemistry and Biology and is being continuously updated and populated enriching its diversity.

In conclusion, during the second phase of implementation national coordinators and partners organized and conducted plethora of training workshops for teachers and activities with students reaching a large number of schools across different countries. The next 9-month implementation phase, Phase C, starts on project month 37. In that phase the total number of schools that will participate is expected to be doubled (see e.g. [7]). Using the experience gathered during Phases B, and A, in order to be able to address the schools' needs of training of their teachers during Phase C partners will direct and focus their effort of support through online means, and less through onsite trainings and visits to schools. In this context a user support task force was formed and led by the WP7 leader in order to organize and provide a comprehensive collection of support materials that can be used for online and asynchronous self-trainings. These include video tutorials, guides of use, tips and frequently-asked-questions, recorded webinars, etc. They are all online, regularly updated and available at http://www.golabz.eu/support (for a brief description see [8]). These will facilitate partners and teachers in the constant uptake of using online labs, ILSs and tools that Go-Lab offers and will sustain its usage during the last implementation phase of the project and beyond.

Table 3: List of implementation activities with teachers and with students organized by national coordinators and partners during Phase B

Country	Partner(s)	Date(s)	Type	Participants (Schools)	Labs	Subject(s)
Austria	CUAS	12/03/2015	Activity with students	30 (3)	Radioactivity, Splash, electricity lab, pH scale	Physics, Technology
Austria	CUAS	28/05/2015	Activity with students	25 (1)	VISIR	Informatics, Technology
Austria	CUAS	28/05/2015	Activity with students	25 (1)	Radioactivity	Physics, Informatics
Belgium, Italy, Poland	EUN, NUCLIO	24/10/2014 - 26/10/2014	Training of teachers	45 (30)	SalsaJ, Sun4all, Faulkes-Telescope	Physics, Astronomy
Europe	EUN	10/12/2014	Training of teachers	16 (10)	pH scale	Chemistry
Europe	EUN	10/01/2015	Training of teachers	24 (15)	pH scale	Chemistry
Cyprus	UCY	17/01/2015 24/01/2015	Training of teachers	32 (10)	Electricity lab, Splash, Guppies	Physics, Biology
Cyprus	UCY	21/01/2015	Training of teachers	12 (5)	Osmotic power, Bond, Electricity lab	Physics, Chemistry
Cyprus	UCY	11/02/2015	Training of teachers	20 (5)	Splash, Electricity lab, Area builder	Physics, Maths
Cyprus	UCY	12/02/2015	Activity with students	12 (1)	Electricity lab	Physics
Cyprus	UCY	12/02/2015	Activity with students	16 (1)	Electricity lab	Physics, Technology
Cyprus	UCY	11/03/2015 12/03/2015	Activity with students	35 (2)	Electricity lab	Physics
Cyprus	UCY	19/03/2015	Activity with students	23 (1)	Splash	Physics
Cyprus	UCY	02/04/2015	Activity with students	15 (1)	Electricity lab	Physics

Country	Partner(s)	Date(s)	Type	Participants (Schools)	Labs	Subject(s)
Cyprus	UCY	23/04/2015	Activity with students	10 (1)	Electricity lab	Physics
Cyprus	UCY	08/06/2015 10/06/2015	Activity with students	41 (1)	Electricity lab	Physics
Cyprus	UCY	26/05/2015 28/05/2015	Activity with students	26 (1)	Electricity lab	Physics
Estonia	UTE	26/03/2015 15/04/2015	Activity with students	82 (1)	Splash, Guppies	Physics, Biology
Estonia	UTE	31/03/2015 15/04/2015	Activity with students	76 (1)	Splash, Guppies	Physics, Biology
Estonia	UTE	08/04/2015	Activity with students	26 (1)	Guppies	Biology
Estonia	UTE	14/04/2015	Activity with students	24 (1)	Splash	Physics
Germany	UDE	13/11/2014	Training of teachers	8 (1)	Osmosis lab , Electricity lab	Chemistry, Physics, Technology
Germany	UDE	19/11/2014	Training of teachers	25 (10)	Osmosis lab , Electricity lab	Chemistry, Physics, Technology
Germany	UDE	02/02/2015	Training of teachers	5 (1)	Osmosis lab, Electricity lab, Craters on Earth, GearSketch	Chemistry, Physics, Technology
Germany	UDE	20/06/2015	Training of teachers	12 (10)	Osmosis Lab, Electricity Lab, Star in a Box, Build an Atom, Splash	Chemistry, Physics, Technology, Astronomy
Germany	UDE	24/06/2015 13/07/2015	Training of teachers	4 (2)	Osmosis Lab, Electricity Lab, Star in a Box, Build an Atom, Splash	Chemistry, Physics, Technology, Astronomy
Greece	EA	12/11/2014	Activity with students	18 (1)	iSpyCMS	Physics

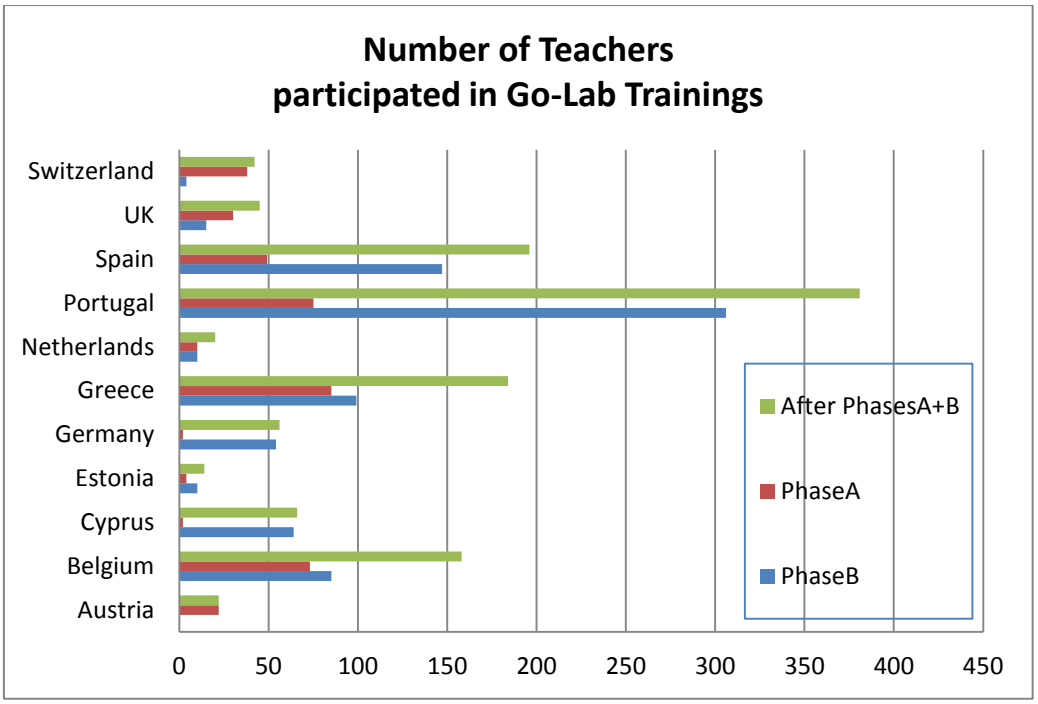
Country	Partner(s)	Date(s)	Type	Participants (Schools)	Labs	Subject(s)
Greece	EA	03/12/2014	Activity with students	25 (1)	iSpyCMS	Physics
Greece	EA	01/04/2015 04/05/2015	Activity with students	40 (1)	iSpyCMS	Physics
Greece	EA	10/03/2015 06/05/2015	Activity with students	22 (1)	iSpyCMS	Physics
Greece	EA	01/10/2014 – 10/05/2015	Activity with students	43 (1)	ESA-SOHO dataset, SalsaJ, Geogebra, Radioactivity, Gearsketch, Balancing Act PhET	Physics, Maths, Biology, Astronomy, Engineering, Technology
Greece	EA	01/04/2015 - 29/04/2015	Activity with students	48 (8)	Splash, PhET Buoyancy Density	Physics
Greece	EA, IASA	21/10/2014	Training of teachers	36 (30)	Hypatia	Physics
Greece	IASA	11/11/2014	Activity with students	25 (1)	Hypatia	Physics
Greece	IASA	26/11/2014	Training of teachers	35 (10)	Hypatia	Physics
Greece	IASA	29/01/2015	Activity with students	40 (5)	Hypatia	Physics
Greece	IASA	12/02/2015	Activity with students	50 (3)	Hypatia	Physics
Greece	IASA	26/02/2015	Activity with students	60 (12)	Hypatia	Physics
Greece	IASA	14/03/2015	Activity with students	100 (20)	Hypatia	Physics
Greece	EA (organizer) and EPFL, UT,NUCLIO, CU, ULEIC	12/07/2015 - 17/07/2015	Training of teachers	28 (28)	SOHO, Geogebra, Star in a box, Sun4all, , SalsaJ, PhET labs, etc	Physics, Technology, Biology, Ecology, Astronomy, Chemistry

Country	Partner(s)	Date(s)	Type	Participants (Schools)	Labs	Subject(s)
The Netherlands	UT	17/11/2014 27/11/2014	Activity with students	220 (1)	Splash	Physics
The Netherlands	UT	15/12/2014	Activity with students	8 (1)	Bond	Chemistry
The Netherlands	UT	16/12/2014	Activity with students	80 (1)	Concept mapping	Physics
The Netherlands	UT	08/01/2015	Activity with students	30 (1)	Bond	Chemistry
Portugal	NUCLIO	22/11/2014	Training of teachers	22 (9)	Impact calculator	Physics, Astronomy
Portugal	NUCLIO ESA	24/11/2014 - 30/11/2014	Training of teachers	19 (19)	Salsa J, Sun4all, Faulkes Telescope	Physics, Astronomy
Portugal	NUCLIO	18/11/2014	Activity with students	30 (1)	Faulkes Telescope, ESA archives	Physics, Astronomy
Portugal	NUCLIO	02/10/2014 04/11/2014	Training of teachers	25 (2)	Salsa J, SOHO-ESA archives	Physics, Astronomy
Portugal	NUCLIO	02/10/2014 04/11/2014	Activity with students	480 (2)	Salsa J, SOHO-ESA archives	Physics, Astronomy
Portugal	NUCLIO EPFL	13/12/2014	Training of teachers	45 (10)	Impact calculator , Salsa J, Faulkes Telescope	Physics, Astronomy
Portugal	NUCLIO	27/09/2014 – 02/02/2015	Training of teachers	74 (4)	Salsa J, Sun4all, Faulkes Telescope	Physics, Astronomy
Portugal	NUCLIO	27/01/2015 – 10/04/2015	Training of teachers	121 (15)	Salsa J, SOHO-ESA archives	Physics, Astronomy
UK	CU NUCLIO EA	13/04/2015 - 17/04/2015	Training of teachers	15 (8)	Faulkes Telescope, Impact calculator	Physics, Astronomy
Spain	UDEUSTO EA	19/02/2014	Training of teachers	23 (10)	Boole	Physics, Electronics, Technology

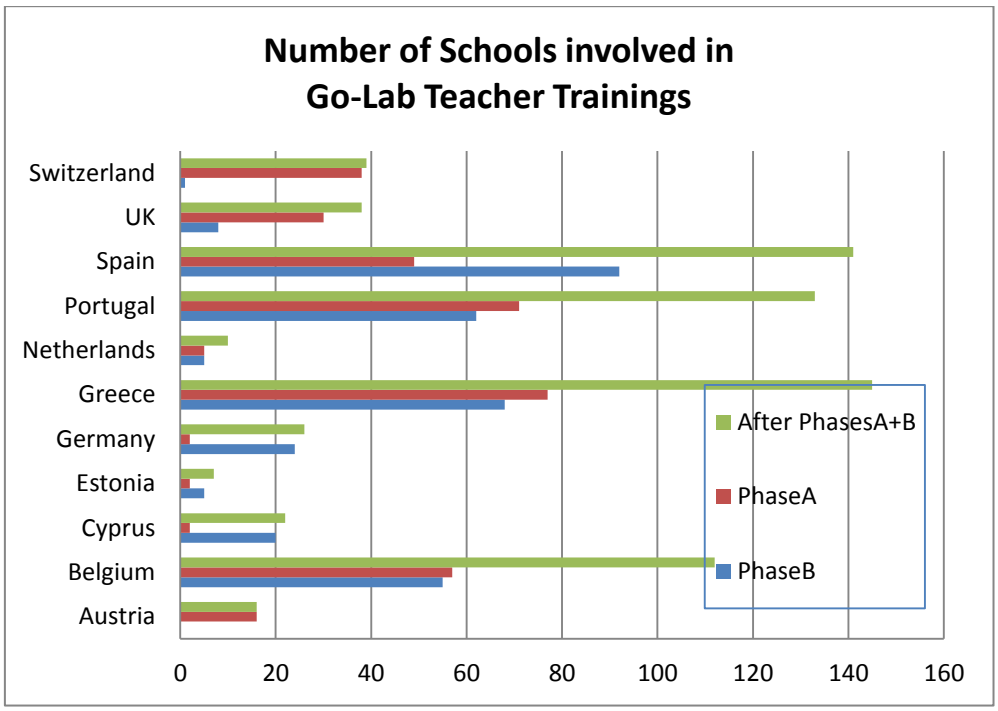
Country	Partner(s)	Date(s)	Type	Participants (Schools)	Labs	Subject(s)
Spain	UDEUSTO	24/04/2014	Training of teachers	19 (12)	Electricity lab, VISIR, Boole	Physics, Electronics, Technology
Spain	UDEUSTO	21/05/2014	Training of teachers	10 (5)	VISIR, Boole	Physics, Electronics, Technology
Spain	UDEUSTO	05/02/2015	Training of teachers	29 (20)	Electricity lab, VISIR, Boole, Splash lab	Physics, Electronics, Technology
Spain	UDEUSTO UNED	25/06/2015	Training of teachers	40 (25)	Electricity, VISIR, Archimedes, Splash	Physics, Electronics, Technology
Spain	UDEUSTO	17/06/2015 09/07/2015	Training of teachers	16 (10) 10 (10)	VISIR, Archimedes, Splash	Physics, Electronics, Technology
Switzerland	EPFL	14/10/2014 08/12/2014 03/02/2015 12/03/2015 22/04/2015	Training of teachers	4 (1)	Splash, Gearsketch, Sun4all, Faulkes Telescope, Geogebra, Impact calculator	Physics, Astronomy, Technology
Switzerland	EPFL	06/02/2015 17/02/2015 10/03/2015 13/03/2015	Activity with students	7 (1) 11 (1) 15 (1) 16 (1)	Splash, Gearsketch, Sun4all, Faulkes Telescope, Geogebra, Impact calculator	Physics, Astronomy, Technology

Table 4: Summative number of teachers, students and schools that participated in implementation activities organized by national coordinators and partners per country in Phase B, in Phase A and in total

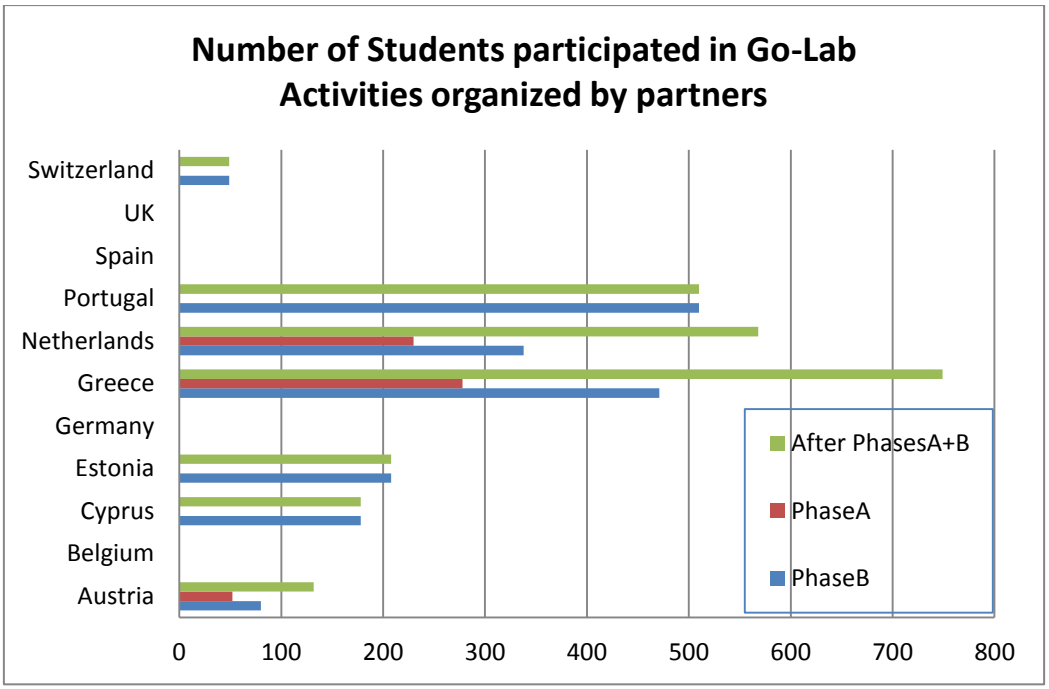
	Austria	Belgium	Cyprus	Estonia	Germany	Greece	Netherlands	Portugal	Spain	UK	Switzerland	Total
PHASE-B												
Teachers participated in Go-Lab Trainings	0	85	64	10	54	99	10	306	147	15	4	794
Students participated in Go-Lab Activities	80	0	178	208	0	471	338	510	0	0	49	1834
Schools participated in Go-Lab Trainings	0	55	20	5	24	68	5	62	92	8	1	340
Schools participated in Go-Lab Student Activities	5	0	9	4	0	54	4	3	0	0	1	80
PHASE-A												
Teachers participated in Go-Lab Trainings	22	73	2	4	2	85	10	75	49	30	38	380
Students participated in Go-Lab Activities	52	0	0	0	0	278	230	0	0	0	0	560
Schools participated in Go-Lab Trainings	16	57	2	2	2	77	5	71	49	30	38	344
Schools participated in Go-Lab Student Activities	4	0	0	0	0	29	4	0	0	0	0	37
TOTAL AFTER PHASES A+B												
Teachers participated in Go-Lab Trainings	22	158	66	14	56	184	20	381	196	45	42	1184
Students participated in Go-Lab Activities	132	0	178	208	0	749	568	510	0	0	49	2394
Schools participated in Go-Lab Trainings	16	112	22	7	26	145	10	133	141	30	39	689
Schools participated in Go-Lab Student Activities	9	0	9	4	0	83	8	3	0	0	1	117



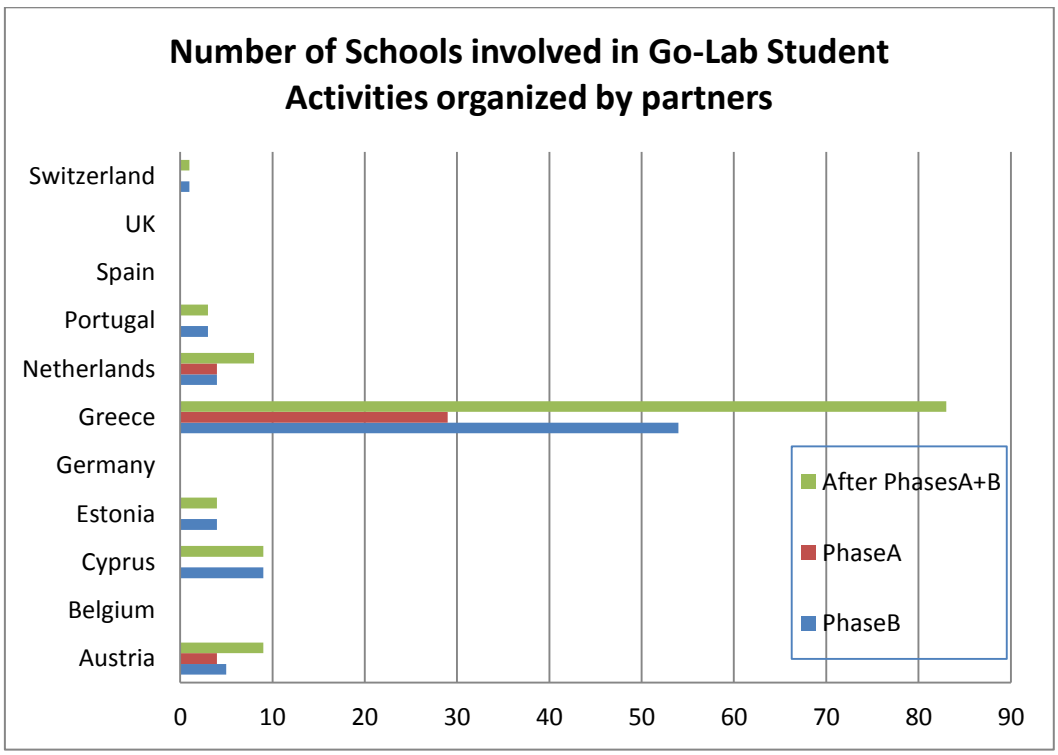
Graph 1: Number of teachers that participated in Go-Lab trainings per partner country in Phase A, in Phase B and in total.



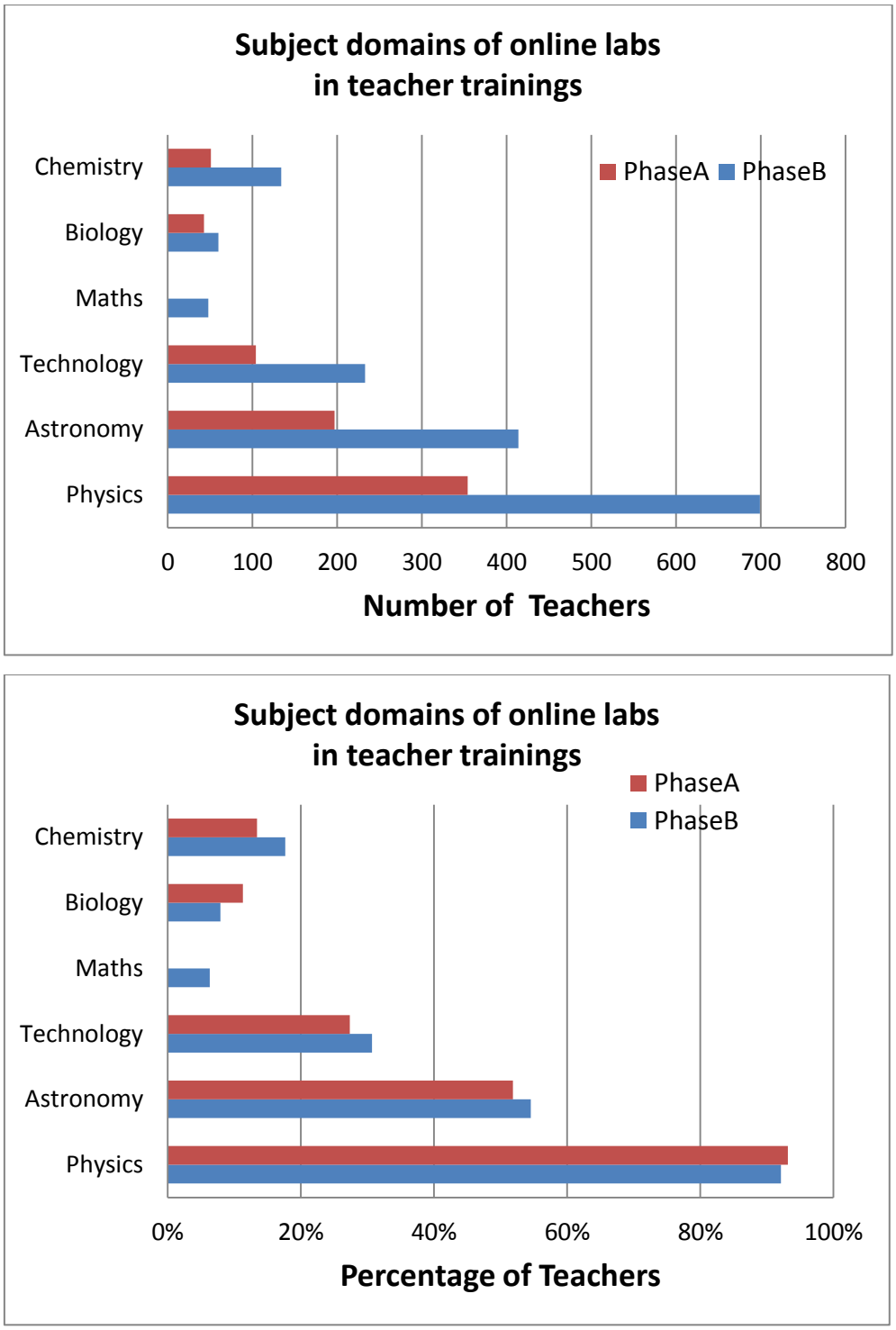
Graph 2: Number of schools involved in Go-Lab teacher trainings per partner country in Phase A, in Phase B and in total.



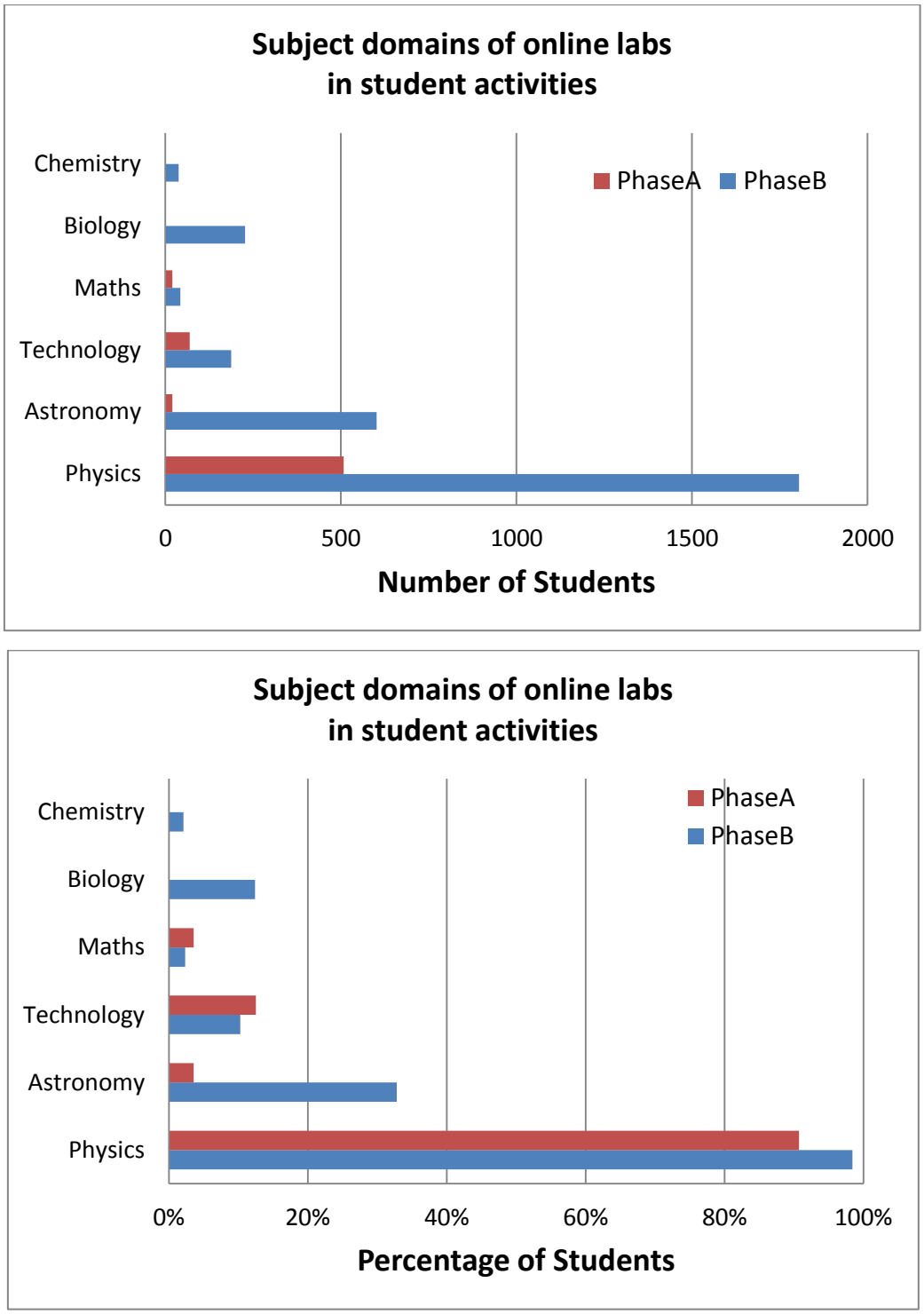
Graph 3: Number of students participated in Go-Lab activities organized by partners per country in Phase A, in Phase B and in total.



Graph 4: Number of schools involved in Go-Lab activities with students organized by partners per country in Phase A, in Phase B and in total.



Graph 5: Subject domains of online labs demonstrated and practiced in Go-Lab teacher trainings in Phase A and in Phase B (top graph: in actual numbers, bottom graph: in percentage).



Graph 6: Subject domains of online labs utilized Go-Lab student activities organized by partners in Phase A and in Phase B (top graph: in actual numbers, bottom graph: in percentage).

References

[1] Go-Lab Deliverable 7.3 “Report on Implementation Activities Phase-A”, Month 27, Jan 2015

[2] Go-Lab Deliverable 7.1 “Pilot Sample Profile – V1”, Month 18, Apr 2014

[3] Go-Lab Deliverable 7.2 “Pilot Sample Profile – V2”, Month 24, Oct 2014

[4] Go-Lab Deliverable 6.1 “Specifications of Participatory Activities”, Month 3, Jan 2013

[5] Go-Lab Deliverable 6.4 “Report on the participatory engagement activities”, M24, Oct 2014

[6] Go-Lab Deliverable 6.5 “Report on development of the virtual Go-Lab user community – V1”, M36, Oct 2015

[7] Go-Lab Deliverable 7.4 “Pilot Sample Profile – V3”, Month 36, Oct 2015

[8] Go-Lab Deliverable 6.6 “Go-Lab user communities support framework and guidelines”, M36, Oct 2015