

# Next-Lab

## Next Generation Stakeholders and Next Level Ecosystem for Collaborative Science Education with Online Labs

*Innovation Action in European Union's 2020 research and innovation programme*

*Grant Agreement no. 731685*



### Deliverable 2.2

## Initial implementation of the teacher-empowering facilities and activities

Editor	Eugenia Kyriotis & Jens Koslowsky (Ellinogermaniki Agogi)
Date	27 September 2017
Dissemination Level	Public
Status	Final



## The Next-Lab Consortium

<b>Beneficiary Number</b>	<b>Beneficiary name</b>	<b>Beneficiary short name</b>	<b>Country</b>
1	University Twente	UT	The Netherlands
2	École Polytechnique Fédérale de Lausanne	EPFL	Switzerland
3	IMC Information Multimedia Communication AG	IMC	Germany
4	EUN Partnership AISBL	EUN	Belgium
5	Ellinogermaniki Agogi Scholi Panagea Savva AE	EA	Greece
6	University of Cyprus	UCY	Cyprus
7	Universidad de la Iglesia de Deusto	UD	Spain
8	Tartu Ulikool	UTE	Estonia
9	Núcleo Interactivo de Astronomia Associacao	NUCLIO	Portugal
10	Ecole Normale Supérieure de Lyon	ENS de Lyon	France
11	Turun Yliopisto	UTU	Finland
12	University of Leicester	ULEIC	United Kingdom

## Contributors

Name	Institution
Tasos Hovardas	UCY
Nikoletta Xenofontos	UCY
Koen Veermans	UTU
Margus Pedaste	UTE
Leo Siiman	UTE
Mario Mäeots	UTE
Äli Leijen	UTE
Diana Dikke	IMC
Joep van der Graaf	UT
Olga Dziabenko	UD
Matthias Heintz	ULEIC
Effie Law	ULEIC
Pamela Andrade Sevillano	ULEIC
Eleftheria Tsourlidaki	EA
Alexandros Chiotellis	EA
Ton de Jong	UT
Jakob Sikken	UT
Javier Garcia Zubia	DEUSTO
Myriam Bentoumi	ENS
Gérard Vidal	ENS
Rodriguez Triana Maria Jesus	EPFL
Denis Gillet	EPFL
Evita Tasiopoulou	EUN
Enrique Martin	EUN
Anastasiya Boiko	EUN
Rosa Doran	NUCLIO
Carlos Santos	NUCLIO

## **Legal Notices**

The information in this document is subject to change without notice.

The Members of the Next-Lab Consortium make no warranty of any kind with regard to this document, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The Members of the Next-Lab Consortium shall not be held liable for errors contained herein or direct, indirect, special, incidental or consequential damages in connection with the furnishing, performance, or use of this material.

The information and views set out in this deliverable are those of the author(s) and do not necessarily reflect the official opinion of the European Union. Neither the European Union institutions and bodies nor any person acting on their behalf may be held responsible for the use which may be made of the information contained therein.

## **Executive Summary**

The overall approach to training in Next-Lab is based on the principle of subsidiarity: The National Expertise Centers (NECs) and Go-Lab Ambassadors are to define and choose the training topics, type and duration of events and workshops best suited. In this deliverable D2.2, Next-Lab partners report and present the ongoing efforts of the implementation of the teachers-empowering facilities and activities under the framework of Work Package 2 for the period of the first seven months (1 January 2017 – 31 July 2017).

This report is structured to describe in section 2.1 the current, ongoing efforts to build common workshop and training materials. It will present then examples of international training activities carried out (sections 2.2 and 2.3) before each partner reports on the activities in their country (section 2.4).

Section 3 presents a brief overview of functionalities developed in Graasp to support teachers in the first months of the project, as an update of the content already introduced in D2.1. Special focus is given to the experience of the newly established Help-desk.

## Table of Contents

<b>1. Introduction</b> .....	<b>8</b>
<b>2. Next-Lab Training Activities</b> .....	<b>9</b>
2.1 Initial Development of Next-Lab Training Material .....	10
2.2 International Training: The Next-Lab Summer School 2017 .....	10
2.2.1 Concept .....	11
2.2.2 Application and Selection of Participants .....	12
2.2.3 Course Program .....	13
2.2.4 Conclusion / Outlook.....	14
2.3 International Training: Go-Lab Ambassadors .....	17
2.4 Implementation of National Training Activities .....	19
2.4.1 Cyprus – University of Cyprus.....	19
2.4.2 Estonia – University of Tartu .....	21
2.4.3 Finland – University of Turku .....	23
2.4.4 France – ENS Lyon .....	25
2.4.5 Germany - IMC .....	27
2.4.6 Greece – Ellinogermaniki Agogi.....	27
2.4.7 Netherlands – University Twente .....	31
2.4.8 Portugal - NUCLIO.....	33
2.4.9 Spain – University of Deusto.....	36
2.4.10 United Kingdom – University of Leicester.....	38
2.4.11 Go-Lab Ambassadors .....	40
2.4.12 Other Training Activities.....	42
<b>3. Teachers Empowering Facilities in Graasp</b> .....	<b>45</b>
3.1 Creation and Personalization .....	45
3.2 Awareness, Assessment, and Reflection.....	46
3.3 Help-desk and Support Activities – The Intercom Platform.....	46
3.3.1 Use of Intercom - Statistics .....	46
3.3.2 Lessons Learnt .....	50
<b>4. Conclusion and Outlook</b> .....	<b>52</b>
<b>5. Annexes</b> .....	<b>54</b>

## Table of Figures

Figure 1. Infographic of Next-Lab training activities.....	9
Figure 2. The Go-Lab scenarios .....	12
Figure 3. Impressions of the 1 <sup>st</sup> Next-Lab Summer School .....	14
Figure 4. Responses of the Follow-up Survey.....	15
Figure 5. Original program of the 1 <sup>st</sup> Next-Lab Summer School .....	16
Figure 6. 14thSPWatFCL plenary sessions.....	17
Figure 7. Next-Lab group sessions at SPWatFCL14.....	18
Figure 8. Secondary teachers search for labs in the Go-Lab portal.....	20
Figure 9. Estonian in-service teachers presenting ILSs.....	22
Figure 10. Students enrolled in a course to create an ILS using Go-Lab.....	22
Figure 11. Teacher training workshop in Evangeliki school in Athens .....	28
Figure 12. Greek Go-Lab Summer School in Marathon .....	29
Figure 13. Workshop's events.....	34
Figure 14. Summer school in Canary Island .....	35
Figure 15. Attendants of the workshop in Barcelona .....	37
Figure 16. Pre-service teachers' training in Haifa.....	41
Figure 17. Workshop in Kyiv, Ukraine, April 2017 .....	43
Figure 18. Number of new users per month from May to June 2017 .....	47
Figure 19. Median response time to requests between May to July 2017 .....	47
Figure 20. Team members most active on Intercom .....	48
Figure 21. Geographical distribution of Intercom requests .....	49

## 1. Introduction

Empowering teacher to create, implement and exploit inquiry learning spaces is the common goal and aim of all Work Package 2 activities. The several tasks foresee to provide a mix of facilities and activities that are aimed to support and train teachers to fully understand, appreciate and/or apply the concepts of Inquiry Based Science Education (IBSE), and the possibilities and opportunities of the Go-Lab ecosystem.

The overall approach to training in Next-Lab is based on the principle of subsidiarity: The National Expertise Centers (NECs) and Go-Lab Ambassadors have established close links to the teachers and the Go-Lab communities in their countries, and are therefore best equipped to define and choose the training topics, type and duration of events and workshops. Consequently, there is not a centrally or commonly defined training program. Each partner has to identify the needs of their own teacher community and the thematic areas that are most appropriate in teacher training to facilitate the use and uptake of Go-Lab in schools.

However, that does not mean that there is no purpose to define or agree as a consortium on a set of competences and skills to be acquired by Go-Lab users, and to prepare accordingly common material with the goal to present a complete Go-Lab curriculum. This is one of the long-term goals of Work Packages 2 during the implementation of Next-Lab.

In deliverable D2.1 we presented the foreseen tools and services for teachers both in terms of designing high end Inquiry Learning Spaces (ILSs) as well as in-class use. The project team has already created a wide array of sustainable support facilities for teachers and designed a set of activities to facilitate their in-depth training. In this deliverable D2.2, Next-Lab partners will report and present the ongoing efforts of the implementation of the teachers-empowering facilities and activities under the framework of Work Package 2 for the period of the first seven months (1 January 2017 – 31 July 2017).

More specifically, this initial report will present the activities of the first seven months of Next-Lab partners and Go-Lab Ambassadors, with a special focus on the training events and activities implemented on international level as well as on country level. In order to ensure a similar level of information and details, all NECs were asked to report the activities on national level, following a similar structure and outline. Already, and only seven months into the project, nearly 700 teachers and users were able to take part in one of the 37 training activities implemented all over Europe and in some cases beyond Europe. At the same time, this deliverable is an opportunity for Next-Lab partners to present their work, and for the consortium to learn about the different approaches followed in participating countries, as well as for NECs to describe and outline their strategy to be followed over the next months.

This report will firstly describe the current, ongoing efforts to build common workshop materials. It will present then examples of international training activities carried out before, each partner reports on the activities in their country. The focus is on presenting the facts. Future deliverables will shift their focus more and more on analyzing the impact or evaluation of carried out training.

Lastly, the Next-Lab team is working on improving the quality of training and its material used by Next-Lab partners and the Go-Lab Ambassadors. The technical team is continuously developing new tools and integrating services that will make it easier for teachers to communicate with each other and seek help directly from the project team.



## 2. Next-Lab Training Activities

Training is crucial part for maintaining and increasing user numbers as well as in enhancing the expertise of users in order to further establish Go-Lab in European classrooms, but also all over the world. Therefore, Next-Lab partners have agreed to revisit and overhaul the training approach implemented in the previous Go-Lab project, with the aim to create a more centralized, modular approach. This new approach and concept, which we aim to apply to Next-Lab over its 36 months duration has been presented in more detail in D2.1.

A key aspect of the (future) Next-Lab training activities is the effort to streamline training and have a common approach and understanding of the important topics and needs. This calls for the creation of a common definition of the needs, i.e. a Next-Lab competence & skill framework, that identifies competencies and skills needed to enhance the user profiles as envisaged in the teacher journey of D1.1 in order to successfully apply and implement Go-Lab in an educational purpose. Once we have reached a common understanding and definition of the skills needed, it will be possible as a consortium to create standard courses based on the identified skills, training workshops and material addressing all areas, be it for offline and/or online training. In the end, we hope to be able to present a Go-Lab curriculum, consisting of the competence framework and courses addressed to specific target and user groups.

However, the effort to create such a common definition and curriculum is a long-term effort and still ongoing. As a start of the project, a first, initial outline for such a competence framework has been developed, defining the four main overall domains for Go-Lab training (see D2.1 for the details): a) Pedagogy / Inquiry Based Science Education (IBSE), b) Use of the Go-Lab Ecosystem, c) 21st century skills / Learning Assessment in Go-Lab, and d) Multiplication / Communication. The 1<sup>st</sup> international training event (Next-Lab Summer School 2017, 9-14 July 2017 in Marathon, Greece), served as a pilot for testing the domains, and for Next-Lab partners to create workshops and learning material based on the overall idea and the concept.

In the meantime, and on national level, training activities have been taking place in all countries, carried out by Next-Lab expertise centers (NECs) and the Go-Lab Ambassadors in their respective countries, as well as on international level (Summer Schools), as it has already been mentioned. Overall, 37 (national) training events have been carried out,



**Figure 1. Infographic of Next-Lab training activities**

ranging from small workshops of 2 hours duration to training courses of several days, training 691 teachers all over Europe in various aspects of Go-Lab, according to the topics chosen independently by each NEC. The reports of the activities per country are presented in Sections 2.3. The following sections will present briefly the efforts and results to produce common workshop materials.

### **2.1 Initial Development of Next-Lab Training Material**

A key challenge of the concept to create training material for workshops that can (and will) be used by NECs and Go-Lab Ambassadors is the complementary expertise or knowledge. Pedagogical partners may feel comfortable running workshops on pedagogical or didactic aspects, such as Cognitive Load Theory or Flipped Classroom, but feel less ready to provide training for learning assessment, 21<sup>st</sup> Century Skills or the technical features and functions of the Go-Lab ecosystem.

The approach to overcome this challenge was to create supporting material and trainer guidelines / instructions along with the workshop PPT presentation, to offer:

- a. **Basic information** (title, proposed duration, links to the Go-Lab ecosystem);
- b. **Requirements** (prior knowledge of other workshops / Go-Lab, minimum / maximum number of participants, special equipment or infrastructure needed)
- c. **Workshop structure and organization** (Rational and objectives, workshops' details)
- d. **Workshop activities description** for each one of the three main parts (Part A – Introduction / Core presentation / Demonstration; Part B - Hands-on and minds-on activity; Part C - Wrap-up activity)
- e. **Additional information** (further background information, studies, articles, links, etc.)

To facilitate the production of workshop materials and the instructions, a template has been created and shared among the partners (see Annex “Next-Lab Face-to-Face Training Workshop Instructions”). The table in Annex “Initial allocation of workshop material development for 1st Next-Lab Summer School” shows the initially agreed allocation of tasks and workshops to be designed for the Summer School in Greece. The work was allocated according to the expertise of each partner and the person month involvement of WP2. In order to make the material accessible to all parties interested to offer workshops, an internal space in Graasp has been created to which all material is being uploaded.

Given that some tasks in Next-Lab have not started yet or that the development of new functions and technical features will still take some time, this initial allocation has been adapted to the Summer School program, and not all workshops have been implemented as initially designed, due to time constraints and the thematic focus on introducing Go-Lab Scenarios to course participants (see section 2.2 Next-Lab Summer School 2017, below). Furthermore, the workshops and their learning goals will be revised, once the competence framework has been developed and agreed upon.

### **2.2 International Training: The Next-Lab Summer School 2017**

The international training events and activities in the previous Go-Lab project have proven to be a highly successful and effective activity and should also be seen as an investment to build, enhance and enable a strong and experienced Go-Lab user base that will have multiplying effects among the teacher community. Spending 5-6 days together (and thus

being able to spend almost 30 hours of training in the same location) has been a great opportunity, both for teachers and the Go-lab team. It provided a unique chance to work together closely, so teachers were able to learn profoundly all the main aspects of the Go-Lab system and context, and the project team and developers were able to receive on-the-spot feedback from the users.

While the main aim of those training events (Summer Schools) in the Go-Lab project was to broaden the user base, create and publish ILSs and establish a strong, sustainable user community that would act as multipliers in their own country, in Next-Lab we intend to develop the concept and purpose of the international training events further: each of the training activities will have a certain theme or focus. It is foreseen to conduct a series of training events with teachers from all over Europe to test and try out new aspects of Go-Lab. As described in D2.1 each course will therefore focus on a specific theme, competence domain or target group. The theme will be proposed by the course organizer and be agreed with at consortium level. The Summer Schools are expected to last at least 5 days, while winter schools may take the form of intensive 3-day workshops taking place over a weekend, to enable the participation of in-service teachers even during the school year. The first Summer School took place in Marathon, Greece on 9-4 July 2017, with a total of 24 teachers.

### 2.2.1 Concept

In the very first months of the Next-Lab project, it was decided that the first Next-Lab Summer School would be designed for experienced Go-Lab practitioners, eager to improve and develop their skills and competences in the use of the Go-Lab ecosystem. The program and course have been commonly created having in mind to focus on enabling experienced users to become Go-Lab Expert Teachers (as defined in D1.1) by training them in the more advanced theory background knowledge, features and tools of Go-Lab.

On the other hand, we wanted to take this opportunity to have gathered so many experienced Go-Lab users to (re-)introduce or test some features that either have not been used that widely so far, or that will be a major focus in the upcoming months. The program reflects the challenge to create a balance between the needs and wishes of the teachers to learn more about the Go-Lab ecosystem, of the Go-Lab developers team to test and try out new functions, as well as generally to try out new concepts for organizing such a course.

The overall course concept was therefore structured around the following main theme: learning how to apply an use the **Go-Lab scenarios**. The aim was for teachers to learn how to use the various Go-Lab scenarios offered on Golabz (<http://www.golabz.eu/scenarios>). A Go-Lab scenario describes already all activities, materials, and interactions for teachers and learners that comprise a complete (online and offline) Go-Lab inquiry learning experience. Scenarios differ in pedagogical and scientific activities and in the combination of a) offline and online activities b) individual or collaborative actions c) distribution of activities over teachers and system, and c) sequencing of activities. On GoLabz, several ready-made scenarios are being offered for teachers to use to crate their ILS.



**Figure 2. The Go-Lab scenarios**

There are currently six different scenarios that can be used to shape the didactical structure of an ILS. Choosing the right scenario depends on a number of considerations. This concern the educational objectives involved, the characteristics of the students, more particular the students' prior knowledge level and the inquiry skills the students possess, and organizational issues. As the teachers selected to participate in the Summer School were already familiar with the "Basic Scenario" and most of them had already used and implemented this scenario in their classrooms, the Summer School was a good chance to introduce them to more advanced scenarios versions.

### 2.2.2 Application and Selection of Participants

One of the major challenges in past training events was the different levels of expertise and experience in using Go-Lab. In order to ensure a more homogenous group of attendees of the training event with a similar knowledge of the Go-Lab ecosystem and good command of the English language, the consortium decided to implement an application and selection process.

In March 2017, a call was published and distributed among the Go-Lab community and through all dissemination channels of the Next-Lab project and its partners. The application form consisted of 4 sections (see Annex Application form for 1st Next-Lab Summer School):

1. Contact information
2. Your Experience with Graasp / Go-Lab (3 Questions)
3. Your (past & future) Participation in Go-Lab / Next-Lab (2 Questions)
4. Past Go-Lab / Next-Lab training & support (2 Questions)

In total, 58 applications had been received. The WP2 partners established a selection committee consisting of a representative of UT, NUCLIO, EUN and EA. A common evaluation grid was developed and applied to all applications. The applications of the teachers with the highest marks were invited to join the 1<sup>st</sup> Next-Lab Summer School.

However, in order ensure also a geographical balance, some exception to the rule were applied (e.g. no more than 2 teachers per country, gender balance, etc.). In the end, 23 teachers were selected to attend, while one additional teacher acquired Erasmus+ KA1 funding to finance her participation.

### 2.2.3 Course Program

As mentioned above, the main focus of the course was for attendees to get to know the different Go-Lab scenarios and associated pedagogical concepts. However, and in addition to introducing the Go-Lab scenarios, several other workshops were offered based on and following the four main training domains defined and described in D2.1. Consequently, the program was developed around the main topic (Go-Lab scenarios), but enriched and complemented by additional workshops:

- **Domain 1 – Pedagogy:** Introducing IBSE; Cognitive Load Theory; Spreading the Word on Inquiry; The Big Ideas of Science.
- **Domain 2 – The Go-Lab Ecosystem:** What's new? New Apps, labs and features
- **Domain 3 – 21st Century skills and assessment:** Apps and labs supporting the 21<sup>st</sup> Century Skills; Learning analytics tools;
- **Domain 4 – Multiplication / Dissemination:** How to become an effective Multiplier; use of Social Media

On the first day, teachers were asked to form groups of 3-4 persons. On the second day, following the introduction of the scenarios, each group was assigned to create an ILS based on one of the Go-Lab scenarios that they have not used before. Additionally, each group was asked to build the ILS on a multi-disciplinary topic. Throughout the week, special time for workshops were provided, given each group the opportunity to work collaboratively to create and develop their ILS. The full internal structure of the program is presented in Figure 4 below. The official program handed out to participants and including information about the excursions is added to Annex Next-Lab Summer School 2017 Program.



**Figure 3. Impressions of the 1<sup>st</sup> Next-Lab Summer School**

#### **2.2.4 Conclusion / Outlook**

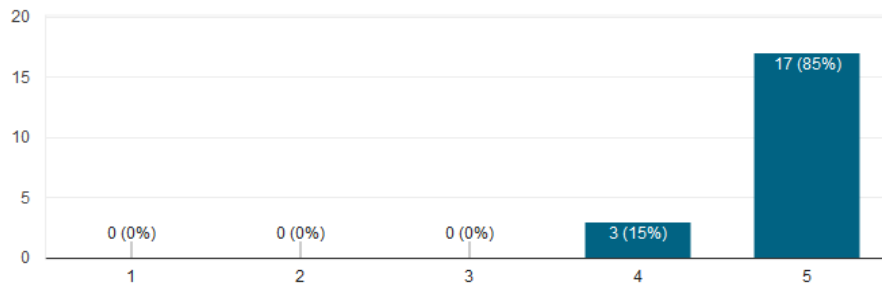
Overall, the 1<sup>st</sup> Next-Lab Summer School was a successful training activity, and it achieved its intended goals:

- The approach to introduce a specific Go-Lab specific theme or focus was well received, both by Next-Lab partners and teachers;
- The collaboration between several partners (EA, NUCLIO, UT, EPFL, EUN, ULEIC) in the organisation and implementation of the training in Marathon was very effective;
- The preparation of workshops, presentations and/or training material by Next-Lab partners (EA, NUCLIO, UT, DEUSTO, UCY, EUN, UTU), even if some of them did not actively participated in the implementation of the training in Marathon. proved to be working, and will be applied also in the future international training events;
- Several participatory design sessions were implemented that provided valuable feedback from the teachers to the Next-Lab team (reported under WP4).

A survey among the participants at the end of the Summer School revealed a very high satisfaction rate

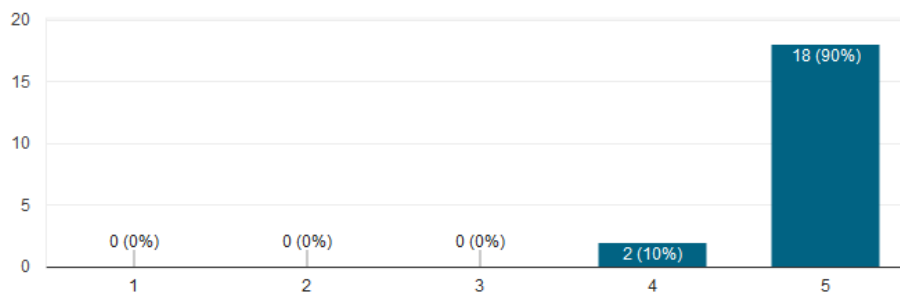
How would you rate your overall experience of the summer school?

20 responses



Do you consider this summer school useful for your practice as teacher?

20 responses



**Figure 4. Responses of the Follow-up Survey**

Next-Lab Summer School Programme						
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Time	09/07/2017	10/07/2017	11/07/2017	12/07/2017	13/07/2017	14/07/2017
09:00-10:00		<b>IBSE I</b> An Introduction (Ton / Twente)	<b>21st Century Skills I</b> Apps for ILS (Jens / EA)	<b>IBSE II</b> Spreading the word on Inquiry: How to introduce inquiry (Rosa / NUCLIO)	<b>Pedagogy II</b> Go-Lab and Flipping the Classroom (Jens / EA based on UTU)	<b>How to become an effective Multiplier</b> Social Media / Visuals How to organise an engaging event Anastasiya / EUN)
10:00-11:00		<b>The Go-Lab Scenarios Workshop</b> / Distribution per team Time for team to get familiar (Jens / Matthias)	<b>Workshop</b> (teamwork)	<b>Pedagogy I</b> Innovative learning approaches: The Big Ideas of Sciences (Eleftheria / EA)	<b>Workshop</b> (teamwork)	<b>How to become an effective Multiplier</b> Social Media / Visuals How to organise an engaging event Anastasiya / EUN)
		Coffee break (20min)	Coffee break (20min)	Coffee break (20min)	Coffee break (20min)	Coffee break (20min)
11:00-12:00		<b>IBSE I</b> Cognitive Load Theory (Ton / Twente)	<b>21st Century Skills II</b> Awereness, Reflection, Assessment (Chus / EPFL)	<b>Workshop</b> (teamwork)	<b>Workshop</b> (teamwork)	<b>PD - Go-Lab Scenarios</b> (Matthias, Pamela / Leicester)
12:00-13:00		<b>Workshop</b> (teamwork)	<b>Workshop</b> (teamwork)	<b>PD - ILS Publication</b> (Matthias, Pamela / Leicester)	<b>Workshop</b> (teamwork)	<b>Reflection</b>
13:00-15:00		Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
15:00-16:00		<b>Registration</b>	<b>What's new ?</b> Community, Forum, Intercom (Chus / EPFL; Jens / EA)	<b>Workshop</b> (teamwork)	Acropolis	<b>Presentations of ILSs</b>
16:00-17:00	<b>Opening</b> Presentation of pogramme Vision of Summer School Finding their teams, etc.	<b>Workshop</b> (teamwork)	<b>PD on Learning Analytics &amp; Tools</b> (Chus / EPFL; Matthias, Pamela / Leicester)	<b>Presentations of ILSs</b>		
17:00-18:00	<b>Ice-Breaking</b>					
18:00-19:00	Key Notes	Sounio				
19:00-20:00	Key Notes					
20:00						Farewell Dinner

Figure 5. Original program of the 1<sup>st</sup> Next-Lab Summer School



### 2.3 International Training: Go-Lab Ambassadors

European Schoolnet (EUN) has carried out one international training during the 14th Science Projects Workshop in the Future Classroom Lab (14thSPWatFCL), 5-7 May 2017. This event was a special edition for Go-Lab Ambassadors. 30 Scientix ambassadors and 17 Go-Lab Ambassadors of the Next-Lab project that are helping bring the Go-Lab ecosystem to schools throughout Europe, attended the event. The program was organised in two parallel streams allowing Go-Lab and Scientix Ambassadors to focus on their respective projects' tasks, processes and implementation aspects.

The 14thSPWatFCL worked as a kick-off meeting for the Go-Lab Ambassadors. Go-Lab Ambassadors have been selected to support the implementation and outreach of Go-Lab in their respective countries. They were invited to receive this three-day training focusing on project-related activities including communication, organisation of events, support provision to teachers, ILS development and management and use of scenarios. In order to equip Go-Lab Ambassadors with the necessary skills and knowledge needed to help them achieve their target and fulfil their role, European Schoolnet collaborated with NUCLIO, EPFL, University of Turku and Ellinogermaniki Agogi, in order to compose and carry out a suitable programme for this training.



Figure 6. 14thSPWatFCL plenary sessions

Throughout the course, Go-Lab Ambassadors' tasks were once more presented and the benefits to become a national representative of the projects were explained. Ambassadors got familiar with the "Memorandum of Understanding" – a document signed between the chosen ambassadors and EUN - where all tasks including dissemination activities, pedagogical support to teachers, reporting, regular meeting attendance, events organisation are listed. Other training topics included:

- **New Community support features** - Teachers learnt about the authoring platform Graasp and its function in the Go-Lab Ecosystem. They were given practical tips for creating a profile and making it informative for teachers who would like to contact Ambassadors via the platform.

- **Technical workshop** - In this workshop, newly implemented Graasp features like “Help & Support”, “Keywords”, and “Peer Assessment” were explained. Teachers found out how they can contribute in advising on technical issues via the Help Desk.
- **Own your ILS: ideas for (re)designing** - The underlying idea of this presentation was to support teachers in taking ownership of an Inquiry Learning Space (ILS) and stimulating them to adapt ILS’s to their educational goals.
- **Social Media and Visual Identity** - Teachers received training on using project-specific social media channels, as well as advice on the importance of respecting the project’s branding and visual identity. In particular, Ambassadors had practical exercises on creation of content-reach social media posts and the effective use of hashtags.

On the last day of the workshop, Go-Lab Ambassadors had the chance to further reflect on the lessons of the weekend and on further activities during a final plenary session including Ambassadors’ reflection, Questions & Answers and next steps. The event ended with the distribution of event certificates and a farewell lunch.



**Figure 7. Next-Lab group sessions at SPWatFCL14**

The 14thSPWatFCL had worked very well as a networking and training event. It played an important part in motivating teachers who joined the Next-Lab project to offer their support to the project in the ambassador’s role and providing them with the effective and hands-on training from the beginning of the project.

## **2.4 Implementation of National Training Activities**

In this section, the Next-Lab National Expertise Centers (NEC) present the training activities carried out between 1 January 2017 until 31 July 2017.

### **2.4.1 Cyprus – University of Cyprus**

#### **2.4.1.1 Overview**

Since the beginning of the Next-Lab project until July 2017, four training workshops were carried out in Cyprus, coordinated by the University of Cyprus, which is the national Next-Lab Expertise Center (NEC). The training events can be categorized in two types, based on their target group and duration. Specifically, two events targeted in-service secondary teachers (physicists, chemists, biologists and technologists) and lasted one day, while the other two targeted undergraduate students in the Department of Education of the University of Cyprus (B.A. in primary education) and lasted for no less than 2 days. All the events were hosted in a computer lab at the University of Cyprus and the participants were beginners in using Go-Lab.

Each workshop for the in-service secondary teachers lasted for one day and it was part of a mandatory professional development program, organized by the Cyprus Ministry of Education. The collaboration between the University of Cyprus and the Ministry of Education came up after an invitation from the NEC to the Secondary Education Administration. Within this collaboration, the first event was organized at the beginning of the year (January 2017) and the second near the end of the school year (April 2017). The training workshops for undergraduate students were included as part of the curriculum of two mandatory courses, the “Computer Science Applications in the Teaching of Science in Elementary School” and “The teaching of Natural Sciences”. The workshops were completed after all users could create their own ILSs (>2 days). More details about the duration and the structure of the workshops can be found in the next section.

The University of Cyprus will continue to offer training workshops for secondary and primary teachers as well as university students. The overall strategy that we want to follow is not only to train in-service teachers but also support graduate and undergraduate students as well, who will be part of the educational system in the future. In addition, undergraduate students have two School Experience courses where they need to design and implement their lessons. We expect that after an extensive use of the Go-Lab ecosystem they will integrate it in their instruction and use it with their students and mentors during their school experience. This, of course, can serve as an extra dissemination plan. Finally, we will continue to have a close collaboration with the Cyprus Ministry of Education, as well as with the Cyprus Pedagogical Institute, so that to increase the number of co-creation events and of course, be able to train and support more teachers in the future.

#### **2.4.1.2 Brief Description of Training Events**

All the participants (namely, secondary teachers and undergraduate students) were familiar with Inquiry Based Science Education (IBSE), the inquiry cycle framework and its five phases. For that reason, the training workshops were intended to introduce the Go-Lab ecosystem (Go-Lab portal and Graasp) and to train the participants for its effective use. As it was mentioned before, all the events were hosted in a computer lab in the facility of the University of Cyprus in Nicosia and each participant worked in a computer (as shown in Figure 8), in order to perform the related hands-on activities.



**Figure 8. Secondary teachers search for labs in the Go-Lab portal**

In total, 36 secondary teachers of several STEM disciplines, e.g. physicists, chemists, biologists and technologists, and 67 undergraduate students participated in the workshops. For the secondary teachers, the workshops lasted approximately three hours, while the undergraduate students were trained for more than 6 hours. In both courses, however, the overall structure was similar: At the beginning, a short demonstration of the Go-lab portal was undertaken, which focused on the content of the portal and on how to search among online labs, apps and inquiry spaces. After that, participants explored the Go-Lab portal themselves, and tried some online labs, apps and inquiry spaces. Then, they were introduced to the Graasp authoring environment, and later, they created an account and tried as many options as they could (for example, they edited their profile, they created an ILS, they added items and spaces, shared a space, etc.), always under the guidance of the instructor.

The main difference between the workshops was that the undergraduate students had more time to interact with the apps in the Go-Lab portal and the Graasp environment. Specifically, in order to explore the apps in the portal, they were directed to try all of them and decide in which one of the five phases of the inquiry cycle they were most suitable. In addition, they extensively used Graasp in order to duplicate an Inquiry Learning Space (ILS), which was given to them by the instructor. The specific ILS included many items (e.g., configured apps, a lab, videos, images, documents) and many specific functions (e.g., text formatting, hidden text, hyperlinks). The goal of this activity was to allow participants work on the creation of an ILS and encounter any challenges during that activity, while the instructors provided help and guidance whenever needed. At this point, it should be noted that at the end of their courses, many undergraduate students had published their ILSs in the Go-Lab portal.

Overall, participants in each workshop learned how to explore the Go-Lab portal and search for online labs, apps, inquiry spaces and supporting material. However, the most important task was the familiarization with the Graasp authoring environment, meaning that all the participants created an account and they tried almost all options offered by the authoring environment. In addition, the Go-Lab portal has been enriched with high quality ILSs, checked and published by the project, which were created by the undergraduate students.

### **2.4.1.3 Conclusion / Outlook**

The overall conclusion that came out from the workshops done in Cyprus, is that the Go-Lab ecosystem is very impressive and teachers are enthusiastic with the resources, the features and the supporting materials offered. Many of the in-service teachers, despite the lack of equipment in their schools, expressed their willingness to use inquiry spaces in their classes. However, they reported that they need more training in order to be able to create their own ILSs. The undergraduate students expressed their satisfaction about Go-Lab and Graasp and they felt ready to use it in a real class in the future. The most important comment that came out from their feedback was that Graasp was a very powerful tool and they had enjoyed creating their own ILSs, some of which had been designed collaboratively. However, they expressed their concern that before they entered a real class they would need additional training and support to create and implement their ILSs.

As a NEC, our plan is to continue the collaboration with the Cyprus Ministry of Education and the Cyprus Pedagogical Institute, in order to invite more teachers in the national Go-Lab community and offer more inclusive trainings about the IBSE pedagogical approach, the new features of the Go-Lab ecosystem and the 21st century skills. In addition, we will continue using Go-Lab within the science education curriculum of the University of Cyprus for training graduate and undergraduate students in science education majors. For our upcoming training events, we will use and adapt the materials prepared by other partners of the Next-Lab consortium, concerning the pedagogy and the new features and services of the Go-Lab ecosystem.

### **2.4.2 Estonia – University of Tartu**

Since the beginning of the Next-Lab project until the end of August 2017, two training workshops were carried out in Estonia, coordinated by the University of Tartu, which is the national Next-Lab Expertise Center (NEC).

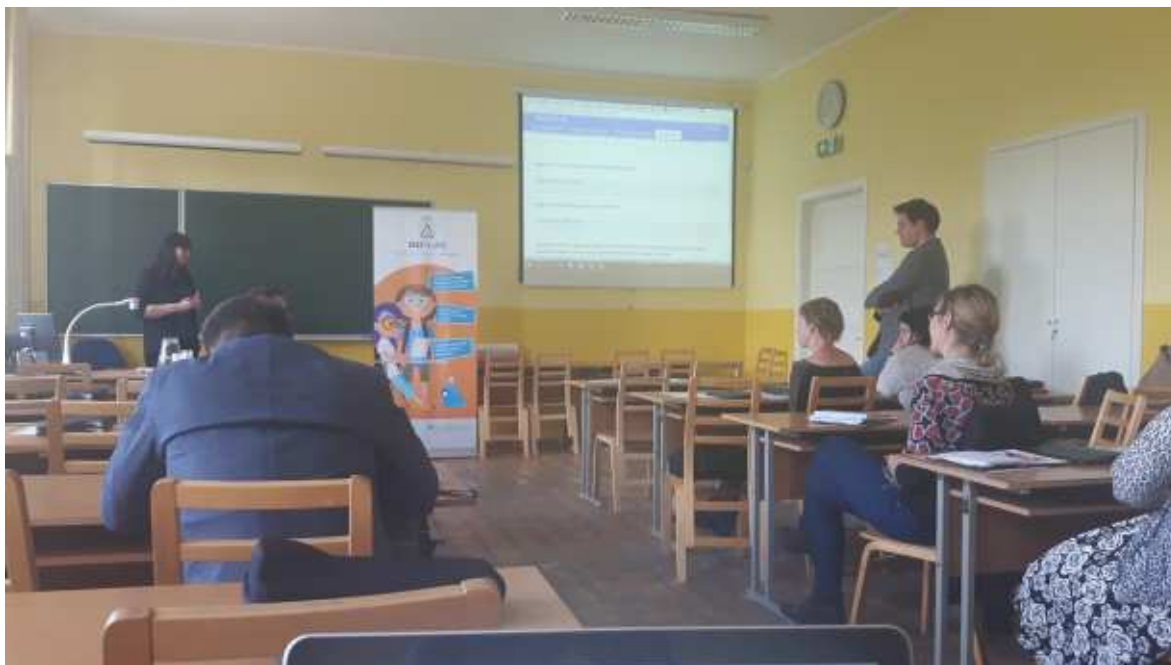
The first training workshop occurred over two sessions. In the first session 27 in-service Estonian educators were introduced to the Go-Lab inquiry learning environment and received a homework assignment to create an ILS, test it with students and present their results in the second session. The second session occurred about two months later, and 10 teachers or teacher-groups (the homework assignment was possible to do in groups) gave presentations (see Figure UTE-1). They discussed how they designed and created their ILSs taking into consideration the inquiry cycle framework, demonstrated various inquiry apps they had included in their ILSs and reflected on their experience of implementing their ILS with students.

The second training workshop involved 10 students who began their studies in a blended one-year Master in Educational Technology program offered by the University of Tartu. This program specifically targets working adults in the field of education who have prior teaching experience. It is a very flexible program in that physical presence at the university is only required for two weeks at the beginning and one-week at the end of the school year. Most of the teaching and learning occurs online. The curriculum is taught in English and more than half of the students enrolled are from outside of Estonia. A mandatory course in this one-year MA EduTech curriculum is “SVHI.06.004 Using Innovative Technologies that Support Inquiry Cycle.” This course requires participants to become familiar with the inquiry cycle framework and the design of inquiry learning materials. In the training workshop the students were introduced to the Go-Lab inquiry cycle and the Graasp ILS authoring platform over two days (see Figure UTE-2). They were assigned a homework assignment to create

an ILS or related inquiry activity to demonstrate their knowledge and skills of creating inquiry learning materials.

#### **2.4.2.1 Brief Description of Training Events**

In terms of the content taught, the two training workshops covered similar topics. First is a presentation to introduce the Inquiry Based Science Education pedagogy. In that framework, which serves as a template for inquiry spaces in Go-Lab, there are five general inquiry phases or stages to consider when designing an inquiry activity.



**Figure 9. Estonian in-service teachers presenting ILSs**



**Figure 10. Students enrolled in a course to create an ILS using Go-Lab**

After presenting the theoretical background of inquiry learning, the training introduces the Go-Lab learning environment. This begun with looking at the Go-Lab repository ([www.golabz.eu](http://www.golabz.eu)) to see what resources are available (e.g., online lab, apps, inquiry spaces) and how they are used. At this point a practical task is assigned to participants where they have to search the Go-Lab repository and find something interesting to show. After a brief discussion of the various resources found on the Go-Lab repository the training continues with an introduction to the Graasp authoring environment.

The Graasp authoring environment was demonstrated to participants by first asking them to create their own account. Then, once everyone had logged in, it was demonstrated how to navigate the Graasp interface and how to create various resources (e.g., text, embedded images and videos, inquiry apps, online labs, etc.). Most important was to show how to create an ILS, add learning resources to the ILS and share the “student view” version of the ILS.

The training finishes with a homework assignment that participants had to create their own ILS and present it during a follow-up meeting. In our first training workshop with in-service teachers participants were also instructed to test their ILS with their students. The follow-up meeting occurred about two months after the first meeting. In the second training workshop with master’s students during the course SVHI.06.004, the students were assigned the homework assignment, and later in 2017 present their work to their peers for comments and feedback.

#### **2.4.2.2 Conclusion / Outlook**

In general, an important conclusion we have drawn is that, when possible, it is very useful to encourage teachers and teacher-students to create their own ILS and evaluate it through testing. This allows them to think through a lesson plan that incorporates the inquiry cycle structure, explore the use of different inquiry apps to support inquiry learning processes and most importantly, test the ILS with students or course peers to gather useful feedback for evaluation.

As a NEC, our plan is to continue offering in-service training at the University of Tartu to teachers about inquiry-based pedagogy, the Go-Lab learning environment and the national Go-Lab community. Also, within the Institute of Education at the University of Tartu, we will begin to offer in September 2017 an inquiry-based learning course (SVHI.06.003 Inquiry Learning) for pre-service bachelor level students that includes Go-Lab related tasks. The course is mandatory for students studying in the curriculum “Teaching Natural and Exact Sciences at Lower Secondary School” and is offered as an optional course for students studying in the curriculum “Special Education”.

### **2.4.3 Finland – University of Turku**

#### **2.4.3.1 Overview**

Since the beginning of the Next-Lab project until the end of July 2017, one training workshop was carried out in Finland, coordinated by the University of Turku, which is the national Next-Lab Expertise Center (NEC). This training was in the form of an invited workshop at the International LUMAT Symposium: Research and Practice in Math, Science and Technology Education (LUMAT) organized by the LUMA Centre Finland (LUMA is a nationwide network for STEM teachers). The aim of the LUMA Centre Finland is to inspire and motivate children and youth into mathematics, science and technology through the latest methods and activities of science and technology education and the yearly conference targets math, science and technology teachers from all educational levels, as

well as prospective teachers and teacher educators. This training workshop involved one session in the conference during which 10 in-service Finnish teachers were introduced to the Go-Lab ecosystem.

The overall strategy that we want to follow is not only to train in-service teachers but also pre-service teachers who will become the teachers of the future (and who will already go to practice in schools during their education). There are two main tracks for pre-service teachers within the Department of Teacher Education in Turku, the first is the elementary school teacher track in which students are at the Department during the full study time and the second the subject teacher track that provides the pedagogical training and qualification for students of other departments/disciplines that want to become subject teachers. This fall we have agreed to offer trainings to around 120 pre-service teachers within courses of both tracks, thus reaching both groups of future teachers, as part of different courses and with different emphases. In one course, pre-service subject teachers will use an ILS that was implemented for the course as part of their inquiry learning experience, whereas in another, the Go-Lab ecosystem will be introduced to the students who will then have the opportunity to do their seminar work about Go-Lab. We expect these experiences to increase their readiness and to start using it also during their training practice in Norssi, the training school that is part of the University.

#### **2.4.3.2 Brief Description of Training Events**

The 2-hour training workshop (May 22; 10 participants) at the LUMAT symposium (Helsinki, 22.-24.5.2017) in Helsinki started with an overview of the inquiry framework by Pedaste et al. (2015) that is the foundation for the design of Go-Lab inquiry learning spaces. In the overview, the five general inquiry phases were presented (Orientation, Conceptualization, Investigation, Conclusion and Discussion) and their function within the framework was explained to the audience. After presenting the theoretical background of inquiry learning, the focus of the workshop moved to the Go-Lab portal ([www.golabz.eu](http://www.golabz.eu)). First, based on an exemplary ILS, the Pedaste framework was revisited and it was shown how the phases come back in the design of the ILS. After that, the original idea was to have a hands-on session with the Go-Lab portal and Graasp, but (even though the LUMA conference had an explicit “bring your own device” policy) as only two of the participants had brought a device with them, the hands-on part of the session was replaced with a demonstration. This demonstration first showed the possibilities for finding already existing resources, after which the attention was shifted from the Go-Lab portal to the Graasp authoring environment. First it was demonstrated how to create a copy of an ILS and how one can share the “student view” version of the ILS with the different login options for students. After that it was demonstrated how to navigate the Graasp interface and how to create various resources (e.g., text, embed images and videos, apps, etc.), and a global overview of different apps and their potential in relation to the inquiry learning framework was given. The session ended with revisiting the Go-Lab portal to look up some resources on topics that the teachers were interested in and a short discussion on their experiences with the Go-Lab ecosystem.

#### **2.4.3.3 Conclusion / Outlook**

One conclusion that came out from the training with in-service teachers is that they were impressed with the functionality and flexibility of the system. As Learning Analytics is a booming topic that schools in Finland are also becoming aware of, one specific feature that made the Go-Lab environment stand out for several of the participants was the presence of integrated Learning Analytics Apps. So, these features of the Go-Lab ecosystem will be



something to highlight in future trainings with in-service teachers. It also became clear that the participants felt that they would need more time to really get a good feel of the ecosystem.

Based on the experience in the first training and also on the experiences in the other countries for the future we will also seek for training opportunities with a longer time span so that the design of an ILS within Graasp can also be incorporated in the training. One place where we will try to do so is with pre-service teachers that are going to do their practice in schools as designing an ILS within the Pedaste et al. (2015) framework, which can provide valuable support to structure, and later, students can reflect on their practice experiences. As such our plan is to expand the role that Go-Lab will play within the curriculum for pre-service teacher education for both the elementary school teachers and for the subject teachers at the University of Turku. Finally, for training the in-service teachers we are currently exploring different options for training opportunities in connection to the Digi-ERKO (a 60 ECTS programme for in-service teachers on learning and teaching in digital learning environments), in which the second cohort has just started their two-year training.

## **2.4.4 France – ENS Lyon**

### **2.4.4.1 Overview**

Compared to many other partners in Next-Lab, ENS is facing the challenge that it has not participated in the previous Go-Lab project, and therefore cannot build on a well-established Go-Lab user base, as many of the other partners can. A quick analysis of Go-Lab and Graasp user statistics have demonstrated that French teachers and institutions have not been very active in the past years in the use of Go-Lab. Therefore, it was necessary to analyze the possible causes in order to build up a strategy to overcome the locks that may limit the French use. Four target groups have been selected in this first part:

- teachers participating in a project on meteorology and climate change with IFÉ to whom Graasp and Go-lab was presented as a shared tool to build and accompany classroom activities;
- teachers participating on a yearly training event at IFÉ in Lyon called “digital week”;
- researchers and trainers participating in a think tank on “new digital learning environments” sponsored by the ministry of education;
- open training session in the form of a hackathon.

In order to use synergies, we approached participants of our project “Tremplin des sciences” to offer online training sessions. The potential audience was ca. 150 teachers and trainers who were introduced to Go-Lab and Graasp as part of a training session for the project “Tremplin”. We decided to call on the 2016 trainees (50); disciplines involved were biology and geology, physics and chemistry, geography most of them coming from secondary schools with few primary teachers. Even if various resources have been created online before the session and some labs fall in the topic of climate and meteorology very few teachers did more than observing what was available, none used ILS in his classroom. All the trainees were considered as beginners and only 9 showed up for the online training events.

Another Next-Lab training session has been scheduled in the IFÉ yearly event “digital week” 23 trainers and teachers were registered at the event. The aim was to propose Go-Lab as both a tool for trainers to teach and a classroom tool. Instead of proposing a conference

and practical work the strategy has been to truly use an ILS for the session then discuss the tools used and see how one can get them and modify them.

The French Ministry of Education is sponsoring a think tank on the question of “new digital learning environments”. We proposed Go-Lab as a tool to be considered and discussed. It has been necessary to build a short training session to explain what can be found in Go-Lab which is pretty far from LCMS like moodle or Caroline and from digital learning spaces software deployed in French schools.

Among the reasons why there is few interest in France emerged the question of the need of scenario that would be closer to Claude Bernard’s “experimental method” which is followed in schools and the question of the insertion of ILS in teaching activities. These two questions were proposed as themes for a hackathon whose purpose was:

1. to propose the basis to build a new scenario if needed or framework to integrate existing scenarios
2. to build at least one ILS meeting the requirements of national disciplinary programs and that could be used by any teacher (of the discipline).

#### **2.4.4.2 Brief Description of Training Events**

Online training took the form of several video-conferences, preceded and followed by online interaction. Most trainees were reluctant to use or build an ILS but participated in the interactions. One challenge was to retain the same audience in all sessions and it was necessary to come back to points already addressed in previous sessions. Our objective was to make the participants use all the material available online to build a sequence in an ILS to be used in their class. Unfortunately, the participants stayed “safe” in what they knew and used Graasp as a structured repository and not as ILS provider.

For the face to face training during the “digital week” we had to consider that Go-Lab and Graasp were not known enough. The aim has therefore been to make the trainees discover the tools by themselves and by using them in a true trainee situation and not as teachers learning how to use a new tool. In a second part, they learn how to appropriate a resource, then modify it to their needs. Our objective was to make interested and digitally advanced users change their habits from classical tools to Next-Lab universe. The trainees showed great interest and curiosity and were very active.

The hackathon enabled to build collaborative translations of scenarios and propose a solution or a remedy to overcome the language barrier with instant translation. Two ILS were produced on transverse themes between biology and geology. The original ILS has been cloned and belongs now to an ILS family which will lead to a final version published in the repository.

#### **2.4.4.3 Conclusion / Outlook**

In the upcoming school year (2017-2018) 4 training events have been scheduled for November, January, March and June. The June event will be a Hackathon where all partners are invited, we think about an online link that may enable synchronous events among partners. As for this year, for the first event we will insist on the use of Next-Lab within the “Tremplin” Project. The four events are registered as IFÉ official training sessions and will benefit from the support of the communication and event management of IFÉ. We will be able to address beginners and more advanced teachers and trainers from both groups we worked with last year with a better support of the institution.

It has appeared during the training sessions that the low participation of French teachers and institution was not due entirely to a lack of communication. The French educational system gives an important weight to tools financed and prescribed by the services and official representatives. It is necessary to convince inspectors, delegates to digital activities, discipline leaders of the quality and the efficiency of next-Lab. We have identified this target that will require dedicated solutions mixing communication, dissemination and training. A session dedicated to this public is scheduled but its form is not yet decided.

### **2.4.5 Germany - IMC**

IMC is a technical partner, and it is not foreseen that IMC is providing special training session. However, there are several initiatives in Germany working towards the digitalization of schools. One of them, conducted in Saarland (where the IMC Information Multimedia Communication AG sits), is the SmartSchool<sup>1</sup> initiative. The aim of this initiative is to demonstrate the potential of digital learning in school education, by implementing digital technologies (learning environments, multimedia content, and school administration systems) in several pilot schools. Two of these schools, the Bellevue School in Saarbruecken and the Gymnasium Wendalinum in St. Wende, are already participating. In 2016, IMC had been in contact with these schools and briefly presented Go-Lab. The school representatives expressed their interest to learn more about the Go-Lab system and to conduct a more detailed workshop. IMC will follow-up this activity and schedule a workshop in each of the two schools. The target group will be the school administration and several science teachers. These will be introductory workshops, as these schools do not have experience with Go-Lab yet. The workshops are planned to take place in the first year of Next-Lab.

### **2.4.6 Greece – Ellinogermaniki Agogi**

#### **2.4.6.1 Overview**

Between January 2017 and July 2017, two national training activities have been organized in Greece (apart from the Next-Lab Summer School described in section 2.2.). The two events differed in duration and size in an attempt to serve the strategy of spreading Next Lab throughout the Greek educational community. In both training events, in total 41 science teachers, with no or very little prior knowledge of Go-Lab, teaching in the grades 7 and above, were introduced to the concept of “Learning by Inquiry” as well as the use of the Go-Lab ecosystem.

The first event was a one-day training activity, which has taken place to introduce the concept of Next-Lab to secondary STEM school teachers. The clear objective was to introduce Next-Lab to teachers with the support of a teacher trainer (Ms. Panagiota Argiri) who is already an advanced Go-Lab user. The invitation to the event has been circulated through an open call among the Greek teachers’ community and supported by the Greek Scientix network. Teachers interested were asked to complete an online registration form. The training event was not focusing on a specific STEM discipline, but the information collected in the registration form was used to understand the distribution of STEM subjects among the participants. Following a brief presentation of the Next-Lab and previous Go-Lab project, the focus of the event was on presenting the Go-Lab ecosystem, and to invite them to register to Go-Labz and the Go-Lab community, as well as to log in and get a first impression of the labs and apps available. By presenting some exemplary ILSs, teachers

---

<sup>1</sup> <https://www.bitkom.org/-Smart-School/>

had the opportunity to experience the potential advantages and benefits for their teaching profession should they decide to use Go-Lab in their daily routine.

The second event was the Go-Lab Summer School 2017 which aimed at bringing together Greek STEM teachers of several disciplines and to teach how to use interdisciplinary teaching approaches through the use of online labs. However, the Summer School was also open to international participants that used Erasmus+ KA1 funding to join the Summer School. A special website has been created to present the course, which included a registration area to be filled for those interested to participate. During this 6 days course, EA - supported by NUCLIO - collaborated with the Greek Ministry of Education as well as the Greek Scientix Network in order to encourage the participants to get familiarized with the Go-Lab authoring environment Graasp and the Go-Lab supportive applications. Participants have been provided detailed guidelines for their best preparation and during the course they enhanced the work they have prepared, working in teams, resulting into ready to be used ILSs. For the needs of the course particular training material has been formed along with presentations that were later distributed to all participants.

#### **2.4.6.2 Brief Description of Training Events**

##### *Teacher training workshop*



**Figure 11. Teacher training workshop in Evangeliki school in Athens**

The first training event has taken place on the 24th of May, 2017 in the premises of the Evangeliki School of Smyrna in Athens, targeting secondary school teachers. It was part of the officially recognized teacher training events that Greek teachers are encouraged to participate in. The event lasted 120 minutes and 26 out of the 28 teachers, who had expressed interest and registered, have participated. The program of the event had been published along with the invitation. The workshop was split into a more theoretical part, which introduced the concept of Inquiry Based Science Education and the Big of Ideas of Science. This was followed by an introduction to the Go-Lab system and several presentations of ILSs that supported aspects of the Big Ideas of Science. Following the theoretical part, the teachers were asked to sign up, log in and browse and use the Go-Lab ecosystem themselves to get familiar with the environment, so that the participants could understand the concept and easily adapt existing ILS for themselves in order to use them in their class. At the end of the event there was a discussion between the organizers and the participants clarifying any indistinct parts of the training. The concept behind this event was to initially introduce Go-Lab to beginners and then to inspire them with the paradigm of an already experienced Go-Lab user from their own community.

### *Greek Go-Lab Summer School*

The Go-Lab 2017 Summer School took place in Marathon, Greece from the 2nd to the 7th of July 2017. It consisted of in total 11 individual workshops and its main objective was to train the 15 participating teachers in using the Go-Lab tools and services while working collaboratively on creating ILs. The Go-Lab Summer School was specifically designed for teaching professionals in STEM disciplines (Science, Technology, Engineering, and Mathematics).



**Figure 12. Greek Go-Lab Summer School in Marathon**

It introduced to the participants the use of online virtual experimentations and remote laboratories as well as inquiry-based science teaching techniques in order to develop, improve and enhance their teaching skills and practices. The overall objectives of the course were to:

- Introduce STEM teachers to the concepts and skills of inquiry learning-design and demonstrating its various applications in inquiry-based learning activities in the science classroom taking into account different teaching and learning styles;
- Familiarize participants with the Go-Lab on-line labs portal and educational digital repositories;
- Develop teachers' ICT skills through the use and application of the Go-Lab tools and services.
- Engage participants in preparing, uploading and sharing digital learning resources and activities using the Go-Lab authoring environment and online labs;
- Introduce participants to the innovative concept "Big Ideas of Science" as means of building multidisciplinary science activities related to the science curriculum;

- Foster the culture of collaboration among teachers of different science disciplines in organizing multidisciplinary activities; to acquaint participants with the significance and opportunities of inquiry-based science teaching through the use of virtual online and remote labs in STEM education;
- Enable teachers to successfully find, develop and apply the innovative, ICT based tools and teaching techniques that will help them create attractive science lessons and thus foster the interest of their students in science topics.

The course included lectures and practical workshops, some of which were prepared and delivered by NUCLIO and the Greek Scientix Ambassador. The detailed program can be found here: [http://golab.ea.gr/sites/default/files/GoLab\\_programme\\_2017.pdf](http://golab.ea.gr/sites/default/files/GoLab_programme_2017.pdf)

The following types of workshops were offered:

- a. Presentation and use of the Go-Lab inquiry learning scenarios.
- b. Hands-on sessions working with the Graasp authoring environment with Go-Lab on-line labs and other external resources.
- c. Presentation and use of the Go-Lab applications and labs.
- d. Presentation and use of the Big Ideas of Science.
- e. Preparing, uploading and sharing digital learning resources and scenarios using the Go-Lab tools.

One of the key aspects of the Summer School was to encourage interdisciplinary teaching and collaborative work among teachers who teach different science subjects. In this scope and as preparation for the course participants were asked to develop a preliminary lesson plan or inquiry activity and to share it with colleague participants during the Summer School and develop it further collaboratively to a final version. In total, the teams presented the following ILSs:

Together, both events – the one-day training opportunities and the week-long Summer School offered very useful feedback from the participants and encourage us to re-think and re-shape the overall training approach for Greece in order to provide and implement a concrete strategy for the training activities in Greece that focuses on both, new users and advanced users.

#### **2.4.6.3 Conclusion / Outlook**

Given the long history of conducted Go-Lab training also during the time of the Go-Lab project, the Greek user community is well established. However, it becomes increasingly clear that further, continuous training is needed to

- a. convince new teachers to use and apply Go-Lab in their classroom teaching and
- b. to keep the existing community alive, interested and inspire them to deepen their expertise, strengthen their user profiles, and to support them to advance in the Go-Lab teacher journey.

Therefore, we are planning to offer over the upcoming months and school year two types of training events:

1. **Singular training workshops and events**, that introduce the concept of Go-Lab to teachers not yet familiar with Go-Lab or online labs. The intention is to get teachers acquainted with Go-Lab and the concept of IBSE, and to raise their interest in the tools and applications.

2. On the other hand, we are planning to offer a **series of workshops** throughout the school year that targets a pool of up to 30-40 teachers, to support their user profile advancement in the teachers' journey. To do this, we hope to get the support of the Greek Ministry of Education, which in the past has shown great interest in Go-Lab. This pool will be a distinct team of either beginners or teachers already familiar with Go-Lab (to be decided still), with whom EA will keep working throughout the school year (2017-2018). The idea is to form and result in a special group of advanced Go-Lab users who then will work as multipliers.

EA will take advantage of its own established network of educators in order to reach as many teachers and teacher trainers as possible. In order to create synergies with other projects and activities, extra attention will be placed on participating in other large events in order to offer and perform Next-Lab workshops. (e.g. EDEN Open Classroom Conference: 20-22 October, Athens – Open Schools for Open Societies 2017 - <http://openschool2017.ea.gr/>).

Also, we will work on establishing stronger contacts to universities and pre-service teachers to eventually offer workshops designed especially for them. Overall, EA's workshops will be adjusted to the needs and experience of the participants and it will be a particular task for the EA team to be in constant contact with interested teachers before and after the workshops to continue to offer their support.

## **2.4.7 Netherlands – University Twente**

### **2.4.7.1 Overview**

Three training activities have been carried out in the Netherlands since the start of Next-Lab. The University of Twente was involved in all three activities as the National Expertise Center (NEC) of the Next-Lab project in the Netherlands.

One activity was a course, called Innovative Technology-based Learning Environments that was carried out at the University of Twente as part of the master's program Educational Science and Technology. Students enrolled in this course can become (and some already are) primary, secondary, and/or vocational teachers, depending on which direction they chose. Any student that is registered at a Dutch university and has a bachelor's degree can participate in this course. There was no further selection process. The students had no prior experience in developing Inquiry Learning Spaces (ILSs).

In this course, students learned about inquiry learning and learning environments. This setting was chosen to provide training on Go-Lab and Graasp, because they are technological tools to design and use innovative learning environments. The materials of this course have been developed at the University of Twente. They have been used and optimized in previous years. The materials are presentations about why and how to use Go-Lab and Graasp, as well as concrete assignments for the students to design their own ILS. Students can choose their own topic when designing an ILS.

The other training activity was a one-day workshop for in-service primary school teachers. It was carried out at the HU University of Applied Sciences Utrecht, which is a teacher trainer institute. They provide short workshops for professionalization of in-service teachers. These courses are offered and teachers can subscribe for these courses. The fee for a course is 50 euros. One of the Next-Lab members of the University of Twente collaborated with a local teacher trainer in the whole workshop. Participants were in-service primary school teachers with no experience in using or creating ILSs. The teachers had to subscribe to the workshop. There was no selection process. Thereafter, the outline of the course was

discussed and the input of both parties was determined. We chose to join in organizing this course, because it was an opportunity to provide, discuss, and use training materials, as well as to exchange experiences in using and teaching Go-Lab and Graasp. The materials used in this course were developed in collaboration. They consisted of presentations about why and how to use Go-Lab and Graasp. In addition, there was a step-by-step explanation of how to select a topic and start to design an ILS. The participants could choose their own topic.

The third training activity was a workshop at the CVO-AV Educational conference 2017 “Examples of Innovation”. During this educational conference, a one-hour workshop with the aim of getting teachers familiar with the Go-lab was given. The goals of this workshop were introducing the Go-Lab portal to the participants and briefly showing them how to use Graasp.eu to create their own inquiry based lessons. This workshop was addressed for beginning Go-Lab users.

#### **2.4.7.2 Brief Description of Training Events**

With regard to the overall setting, the course was carried out at the University of Twente. Twenty-three students participated in 8 weekly sessions of 1.5 hours. The sessions consisted of presentations about learning environments and innovative technology, and of hands-on workshops where Graasp was used to design ILSs. Each session consisted of a presentation on a specific topic (e.g., cognitive load theory, collaborative learning, gaming, use of instructional videos) and a design part in which students could apply knowledge from the lecture to their ILS design. In the final meeting students (who worked in groups of 3-4) presented their ILSs. The course was organized solely by the University of Twente. The other training activity, a one-day workshop for in-service primary school teachers, was carried out at the HU University of Applied Sciences Utrecht. The session consisted of a presentation and a hands-on activity. The workshop was a combined effort.

The main objective was to let the students and teachers learn why inquiry based learning can be useful and how to design materials that incorporate this instructional approach. The second objective was to let the participants learn how to use Go-Lab and Graasp for this purpose. The course for students also aimed at using innovative technology in the ILSs, whereas this was not an explicit objective for the teachers.

At the CVO-AV Educational conference 2017 “Examples of Innovation” workshop, approximately 20 secondary in-service teachers participated. The workshop started with a brief introduction about inquiry based learning in general, the positive effect of the use of virtual laboratories in class, and how to work with the Go-Lab portal as a teacher. After this introduction, the Graasp authoring environment was demonstrated. Unfortunately, the time scheduled for this session was reduced from 2 hours to only 1 hour because of an organizational mistake, leaving too little time for hands-on experiences. The teachers who participated in this workshop had the opportunity to get a glimpse of the Go-Lab environment and gain a little experience with the Graasp authoring environment. After the workshop participants had the opportunity to fill in an evaluation form, 14 teachers completed this evaluation form and the workshop scored a mean score of 3.7 out of 5. A common comment was that the amount of time scheduled for this workshop was too short and more time was desired. Another general comment was that teachers found the shown examples useful and had the feeling that they could use these in practice.

#### **2.4.7.3 Conclusion / Outlook**

The University of Twente has used Go-Lab and Graasp multiple years in a course for master students. With this experience, new courses can be designed along the same guidelines



for incorporating Go-Lab and Graasp. Also, the materials of this course can be adjusted to fit the needs of other teacher training institutes. This way the age of the children to be taught can be taken into account, as well as the specific curriculum. There are plans to collaborate with ELAN, which is a teacher trainer institute in the Netherlands, in a course that aims to teach students to design their own teaching materials. This course has a more applied character and these materials that will be developed can be used by other teacher training institutes as well, such as the HU University of Applied Sciences Utrecht.

Besides pre-service teachers, we aim to give workshops to in-service teachers as we did at the CVO-AV workshop. There is a platform for teachers to keep track of their professionalization via trainings and workshops in the Netherlands. It will be obligatory for teachers from the next school year 2018-2019 onward to participate in a number of workshops. Currently, we are working on a proposal for our own workshop. The feedback we received from the CVO-AV workshop gave an indication that for future workshops we should need to give the participants more time to work with the materials and create their own inquiry learning spaces. This way we can also collaborate with other teacher training institutes, as the teaching materials meet the requirements. Also, the previous collaboration with the HU University of Applied Sciences Utrecht can help in order to create our own workshop. Besides, one in-service teacher, who also participated in the Go-Lab project and gave workshops about Go-Lab, now works part-time on the Next-Lab project at the University of Twente. We can use his experience as well in creating training materials.

To conclude, our experience is that pre-service teachers and teachers alike want to get to know Go-Lab and Graasp and use it in their own classroom. They acknowledge that most of them need some training, which makes the training activities more relevant and attractive. Therefore, in the future, we as a NEC, will continue to find our way to the classroom by providing (pre-service) teachers training in Go-Lab and Graasp, so that they are enabled to use modern technology and inquiry learning in the classroom.

## **2.4.8 Portugal - NUCLIO**

### **2.4.8.1 Overview**

During the reporting period, we have conducted in total two teacher training events (30 hours each), involving 38 teachers from 7<sup>th</sup> grade to secondary school, 13 workshops for teachers (one-day events-lasting 6 hours) involving 263 teachers. Teachers participating were covering all grade levels and those training activities were conducted across the country: Alqueva, Braga, Coimbra, Lisbon and Porto. Additionally, five workshops for students (one-day events- lasting 3 hours), reaching 122 secondary school students, where we introduced one ILS relevant to their ages and in accordance to their curricula. During the summer activities, we have conducted a workshop for graduate and undergraduate students, in Lithuania, with a special interest in astronomy education and outreach. Four international Summer Schools have been organised or co-organised: in Marathon (reported by EA), on Canary Island and on Azores Island. In Canary Island, we gathered over 40 teachers from Spain, Portugal, US and Lithuania. In Azores Island, we gathered 19 teachers from Latvia, Portugal, Finland and Germany. We also had the opportunity to present the project to an important meeting that took place in Ethiopia and we managed to gather representatives from several African countries, resulting into 40 teachers participating in a 4 hour Go-Lab introductory workshop.

The training events were made both for teachers, who are already using Go-lab and beginners and they were also targeting Go-Lab users and beginners but the interest was placed on specific topics at the beginning and on an overview for the ones organized later.

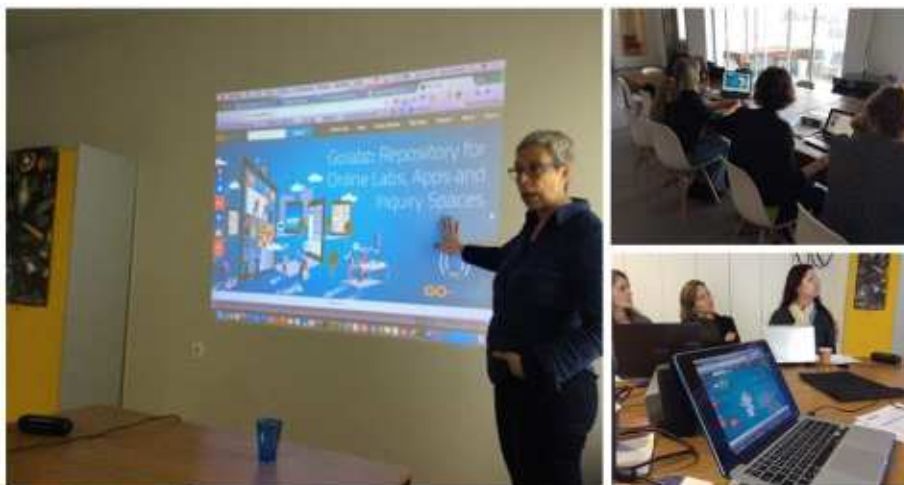
The majority of the participants in the workshops were physics teachers, but we also had several educators from the fields of Biology, Geology, Natural Sciences and Mathematics and a few primary school teachers, Portuguese language teachers and history teachers. With the exception of the training in Marathon no Go-lab Ambassadors were involved.

There was no explicit selection process for the workshops or training events and no preparation of materials had taken place, as the training focused on exploring the portal and the use of Graasp.

#### **2.4.8.2 Brief Description of Training Events**

##### *One Day Workshops*

The short duration workshops had two models, one for beginners and another for expert teachers. The expert teachers had an introduction to Next-Lab news and later they were invited to think about the use of interdisciplinary approach while rehearsing the creation of scenarios that can be used in classroom. During these events, we started by introducing and/or reviewing the inquiry methodology. We then evolved to a discussion about the introduction of interdisciplinarity in classroom and the introduction of the art component in their lessons. Teachers were then invited to create a STEAM activity, where inquiry has to be used. After their ideas were gathered we introduced to them the authoring tool and we invited them to draft an interdisciplinary scenario using the platform. The same approach was used for expert teachers and beginners. The difference



**Figure 13. Workshop's events**

between the two audiences was the time allocated for the introduction of the portal and the authoring tool. The main goal of these events was to present a new approach for science education and to have teachers from different subject domains collaborating for the creation of an ILS contemplating the same topic from the point of view of their own field of expertise.

##### *Certified teacher training events*

These events, lasting between 25 to 30 hours had as a main purpose to make teachers acquainted with the methodology, tools and resources provided by the portal and the authoring tool. Several of these teachers participated in the short duration courses and had the opportunity to improve their knowledge. We conducted two such events, one in Cascais at Centro de Interpretação Ambiental and another one in Madeira at Escola Dr. Horácio Bento (Funchal). The training events and the long duration events, had the following components:

- Introduction to the methodology of inquiry
- Introduction to the interdisciplinary approach and the big ideas of science
- Exploring the Go-lab Portal

- Copy and creation of ILSs
- Creation of interdisciplinary ILSs and its subsequent implementation

The long duration teacher training events happened in Madeira Island and in Lisbon, lasting several days. The main goal of these training activities was to provide a more in-depth training. The training events were fully constructed and organized by NUCLIO. We didn't prepare training materials as we wanted the whole experience to be tailored made for the specific audience. The design of the foreseen final outcome was jointly designed by the group.

### *Summer Schools*



**Figure 14. Summer school in Canary Island**

astronomy as a topic. In the Canary Island teachers had the opportunity to visit the Teide Observatory and the La Palma Observatory. In Azores, the main focus was the integration of astronomy, geology and biology and how the art component could help them to enrich their lessons. They had the opportunity to learn how to use drones, to visit a volcano and to have a cultural visit to the Terceira Island. Participants also had a brief introduction to programming and the use of raspberry pi in their lessons.

### *Student's workshops*

The workshops with students were conducted as a supporting activity to Go-Lab teachers. The idea was to explore the impact on students when presented to the opportunity to conduct real research in classroom. The topic chosen was the analysis of images of a Black Hole Candidate. Students were invited to reflect on how scientists know they have found such an object and by using real images they were invited to explore the possibility of having found a real source. By the end of the workshop students built the light curve of a black hole candidate (a graph presenting the variation in brightness of such objects).

### **2.4.8.3 Conclusion / Outlook**

Teachers participating in our training events felt very motivated to integrate the presented tools and ideas in their classrooms. In general, they appreciated the flexibility of the ILS structure provided and the possibility to follow students at an individual level. To many of the participants the use of the inquiry methodology was as first encounter. We opted to stick to the basic scenario in order to make the process as simple as possible. All participants started the creation of their scenarios and in most cases along with colleagues of a different subject domain. Further courses with the same audience are now necessary in order to follow their evolution and the probability of implementation runs.

For the next school year and as part of our national strategy we are developing a new certified teacher training course that will be focusing more on the interdisciplinary aspect of the curricula. We will be using Go-Lab as a tool to introduce teachers to the new model being adopted in the Future Classroom Labs. We are also discussing with University of Coimbra and Escola Superior de Educação de model ton involve in training pre-service teachers and ways on how to train in parallel the university and ESE tutors.

Last, in Portugal the Ministry of Education is starting a large initiative to provide curriculum flexibility and to create the Future Classroom Labs and we are investing in the construction of interdisciplinary scenarios with teachers coming from different subject domains.

## **2.4.9 Spain – University of Deusto**

### **2.4.9.1 Overview**

Since the beginning of the Next-Lab project until July 2017, several offline and online training workshops were carried out in Spain, coordinated by the University of Deusto, the Next-Lab Expertise Center (NEC) in Spain. The training events were organized to train in-service teachers of secondary school. All events were computer based - one of them used a computer room at the premises of the University of Deusto; during another workshop teachers came with their own computer. All the participants were beginners Go-Lab users.

For the organization of workshops, University of Deusto follows different approaches such as a) contact Regional Agencies for the Professional Development of Teaching, like Berritzegune in Basque Country, CESIRE in Catalonia (in Spain the education is supervised by the 18 regional governments and parliaments), and b) following an online approach by contacting directly interested teachers through e-mail and social networks.

The main objective of the workshops is to increase the teaching performance of the attending teachers. To reach this goal we use Go-Lab ecosystem tools and the IBSE pedagogical approach for creating new ILSs. Using this approach, we align the potential of the Go-Lab ecosystem with the needs of the teachers from the beginning. They know that they have (the opportunity) to create an ILS in order to use it later in their classrooms.

We use three different styles of training conducting: a) offline workshop lasting several days, b) 2-hour short session, and c) a set of webinars. In general, the workshop for beginners lasts 3 days. It provides sufficient time to understand the pedagogical theory and enough time to practice to the use of the tools and to create at least one ILS. UDEUSTO also organizes short 2-hour face-to-face sessions to present the potential and the benefits of using the Go-Lab ecosystem. The main objective of such short sessions is to attract teachers with Go-Lab ecosystem and, therefore, for the full-cycle training.

### **2.4.9.2 Brief Description of Training Events**

In Spain by July 31<sup>st</sup>, 2017 UDEUSTO organized two workshops: Bilbao (7 teachers for 4 days in January/February) and Barcelona (27 teachers for 3 days in July); 2 short sessions in Barcelona (February), San-Sebastian (Summer School in July), and 2 webinars for beginners connected in one set. All the attendees of the workshops received an official certificate and it can be used by teachers for their careers. All this experience should increase the number of workshops in the second year of the project and the collaboration with other institutions and associations to train more teachers.

From the very beginning, we assume that attendants were beginners in Inquiry Based Science Education (IBSE), and in Go-Lab ecosystem. The workshops were hands-on sessions; and computers were required, as it shown in Figure 15.



**Figure 15. Attendants of the workshop in Barcelona**

The workshops in Bilbao (4-day) and in Barcelona (3-day) had similar structure. Every session had a duration between 4 and 5 hours (4 hours in Bilbao and 5 hours in Barcelona). On the first day, the teachers were introduced to the Go-Lab ecosystem and IBSE, and they had a time to explore the Golabz platform. Also, they saw how to create an ILS in 1 hour. The first session ended with a discussion of a possible concept, topic or experiment that could be developed in the ILS. Teachers understood that the correct selection of the activity topic was the key of the ILS design.

On the second session, teachers work phase by phase (the five phases of the IBSE) supervised by the moderator of the session. During this session participants learned how to search a tool in the Golabz, how to use the Graasp, how to configure a tool in the Graasp, the difference between teacher's and student's interface, etc. The main objective of this session is to empower attendants with Go-Lab ecosystem: teachers should be comfortable with the Golabz and Graasp and able to create a simple ILS even without knowing all the possibilities of the ecosystem. At the end of this session, the teachers discussed their experience and their results.

On the third session, teachers finish their ILS with the support of the supervisor and their colleagues. The trainer demonstrates the features and function of the Learning Analytics tools and how to incorporate them in the developing ILS. Also, at this moment the student's evaluation process is introduced usually. Finally, the trainer shows how to publish the created ILS. By the end of session some teachers should be able to publish their ILSs, and the rest of the teachers should know how to organize the information before publishing the

ILS. The goal of the Spanish workshops is to create an ILS that could be used in the classroom.

Two Go-Lab expert teachers were invited by the organizer (a Non-Profit Foundation connected CESIRE Office) to the workshop in Barcelona. They support the NEC trainer and encourage the teachers by explaining them the advantages and solution for ecosystem.

In Bilbao, an additional session was organized where the teachers presented the created ILS to the rest of the attendants and to the coordinator of the Berritzegune (Mrs.Elvira Gonzalez).

The online training is designed in format of a webinar. The difference between the online and offline workshops is that the work such as the design of the ILS and getting familiar with the Graasp and Golabz tool were performed by teachers themselves without the help or the support of the trainer in real time. Until the 31<sup>st</sup> of July two sessions (presentation of the Go-Lab/Next-Lab project, ISBE pedagogical approach, Go-Labs apps and labs) were delivered to the in-service teachers. The next two sessions will be conducted in September and October and will finalize the full cycle of training of applying Go-Lab ecosystem in STEM school instruction.

#### **2.4.9.3 Conclusion / Outlook**

UDEUSTO as the Go-Lab NEC is planning to continue the workshops and online webinars in 2017-2018 school year. Recently, we have an established cooperation with local Schools of Teachers (Teacher Training Institution) at the University of Basque Country and at the University of Deusto. The training on the Go-Lab ecosystem as a case-study of computer-based tools for undergraduate students in science education majors are expected to start in October 2017. The IBSE session is followed by TTI lecturers as a topic of science education curriculum master thesis for pre-services teachers. Additionally, we set up contacts with few national networks of schools that are maintained by religious or civil associations to train their in-service teachers. The first 3-day workshop will be held in mid of September in Valencia. For our upcoming training events, we will use and adapt the materials prepared by other partners of the Next-Lab consortium

Overall, the participated teachers showed strong interest of applying designed ILSs in their teaching process. They expressed their satisfaction of the offered features, resources and instruments of Go-Lab-ecosystem. Moreover, they showed a willingness to participate in testing of the new tools and features developed by the Next-Lab consortium.

### **2.4.10 United Kingdom – University of Leicester**

#### **2.4.10.1 Overview**

The training activities of the University of Leicester team were joined with their Participatory Design (PD) activities. This combination was done as training can be necessary to elicit meaningful PD ideas and feedback, especially when dealing with inexperienced users or newly introduced Go-Lab artefacts. On the other hand, results from the PD activities can indicate the need for training, as not only issues in the current design can be detected, but also missing knowledge and experience in the participants, which can then immediately be addressed as part of the workshop activities after the PD evaluation. Additionally, the grouping of those two activities in single events allowed for an efficient and effective use of the time and resources available.

As a result, not only sole PD workshops and activities have been performed by the ULEIC team (see Deliverable D4.1 for details), but also combined training and PD events, which

are described in the following sections. Based on the Go Lab artefact under evaluation, the training aspects, methods and materials varied for different sessions, but in general they started with a brief introduction of the project, followed by a detailed explanation of the specific topics or artefacts targeted in the event, and, where possible, by hands-on experience and some form of feedback gathering.

In this report, we are going to report on one event in particular, with a rather large and substantial training portion. The training was conducted offline as part of a two-hour PD workshop. The face-to-face setting was chosen because it allowed the three researchers conducting the event to directly observe the participants during the hands-on training period and directly support or answer questions in case any issues were encountered.

The participants of this training event were pre-service teachers from the University of Leicester with various STEM backgrounds. This target group was chosen as addressing pre-service teachers is one of the new foci of the Next-Lab project. As they only knew general information about the Go-Lab system and Next-Lab project, which they got from presentations in a taster session run half a week earlier by the ULEIC team, the participants recruited for this training event during said taster session were beginner Go-Lab users. Nevertheless, they were very enthusiastic to learn about and try out the components and functionalities offered by the Next-Lab project.

In addition to this and other events run in the United Kingdom by the ULEIC team, members of the team also combined efforts with other partners and supported the Next-Lab project training activities at the Go-Lab Ambassadors Workshop in Brussels (see section 2.3) and at the 2017 Next-Lab Summer School in Marathon, presented in this document in section 2.2.

#### **2.4.10.2 Brief Description of Training Event**

The two-hour PD workshop with 12 pre-service teachers and a teacher trainer outlined above was performed on 27/02/2017 at the Brookfield Campus of the University of Leicester, UK. The training activities focused on: a) how to find resources, such as apps and labs, on the Golabz portal and b) how to create an Inquiry Learning Space (ILS) with the Go Lab authoring facilities. Both of these training needs were addressed through a mixed approach of presentation and hands-on activities.

The workshop started with a general introduction, including the experience of a Go Lab student by going through an ILS. Content and functionality of the Golabz portal, its different sections and search and filter facilities, were then presented in a live demo of the website and its features to the pre-service teachers. Following this, participants were asked to explore the portal on their own devices. While doing so, they should also identify a lab and apps to use later on, when creating their own online lesson.

In a later part of the event (after a PD activity evaluating the GoModel app, not reported on here) the Go Lab ILS authoring facilities were presented to the teachers, including how to create a Graasp account, how to create an empty ILS or clone an existing one, and how to fill the different phases with content (text, photos, YouTube videos, apps, and labs). This was followed by another hands-on session in which the participants started to create their own online lesson using their choice of Go Lab resources. The three researchers present for the event used this opportunity to further train the participants during this activity by mingling and providing support. The goal of these training activities was to prepare pre-service teachers to create their own ILSs, having started working on their first one during the training session.

As this event was customized to not only provide training to the participating pre-service teachers, but also to collect their PD input, the ULEIC team did not implement any of the workshops prepared by other partners. The training was supported by a short Microsoft PowerPoint presentation, but other than that there was no training material. Instead, live demos and hands-on activities were used to give the teachers a better and deeper understanding of the websites and tools offered by the Next-Lab project.

#### **2.4.10.3 Conclusion / Outlook**

General feedback on the workshop was collected from the participants of this session using a worksheet (as also reported in Appendix A of Deliverable D4.1), with the following results of interest for this deliverable being gathered:

- 10 out of 12 participants found the workshop to be informative and were interested in engaging with the project further.
- 11 of them believed the Next-Lab facilities and resources could be an asset on their teaching and were interested in writing their own ILS for future use in the classroom.

It can be inferred from these results that both the training workshop and the Next-Lab project were very well perceived by the participants and therefore similar workshops for the target group of pre-service teachers could be done similarly to be engaging and successful.

Although the event presented as an example in this deliverable was aimed at pre-service teachers, similar events are currently being planned to be performed with in-service teachers as well. Initial planning activities are performed with various schools in Leicestershire, Peterborough, and Leeds in the UK. Additionally, to also support the goal of Next-Lab to reach a broader, world-wide user base, possible partner schools in Ecuador have been approached regarding the possibility of training science teachers and students there in the use of the Go Lab artefacts.

One of the possible upcoming events in Leeds would take place over the span of two hours, which could contain a general presentation of the project, followed by a hands-on activity for teachers where they could create their own ILSs, collecting feedback on the process or the artefacts, and finishing with further information about newly added resources in Next-Lab (using the 21<sup>st</sup> Century Skills slides prepared by the UCY team for example). As the planning for the other events is still ongoing, content, material and topics are still to be decided and prepared according to the specific needs of each session.

However, as this mixed approach has proven useful, the ULEIC team plans to keep integrating training and PD activities in future workshops as well. This will make further use of synergy effects between PD and training.

### **2.4.11 Go-Lab Ambassadors**

#### **2.4.11.1 Israel**

##### *Overview*

A first training session has been organised by Go-Lab Ambassador for Israel, Stella Magid-Podolsky in Kfar Saba, Israel on June 20<sup>th</sup> 2017. The training took place as part of the Pedagogical development schools conference for pre-service teachers at Beith-Berl College for teaching and education. A total of 200 pre-teachers attended this conference. Next-Lab have been presented during the session for Mathematics, STEM and Geography teachers (35 pre-service teachers).



A second training took place in Haifa on Just 25th 2017. The training targeted again pre-service teachers and was part of the academic course "STEM teaching skills and methods". The session aimed to provide participants with ground information related to the use of online laboratories and train them on how to use, reuse and create their own ILSs. Stella is a teacher trainer and the Faculty of Education in Technology and Science in Technion, together with the Israeli Institution of Technology and Science invited Stella as a guest lecturer to a summer course after a meeting with Prof.Miriam Barak and an introduction to Next-Lab.

The target audience of these summer trainings was pre-service STEM teachers covering Physics, Chemistry, Biology and Mathematics. Participants have been recruited directly from the institution so Stella had no involvement on the selection process. Regarding the materials, Stella has reused materials she has prepared herself and some she has received during the Next-Lab Summer School that took place in Greece during summer 2017.

#### *"Inquiry in academy and schools"*

This Next-Lab training session has taken place as part of the Pedagogical development schools conference for pre-service teachers in Kfar Saba, Israel on June 20th 2017. The session was attended by 35 STEM and Geography teachers.

The programme was composed by the following parts:

- Introduction to Scientix and Next-Lab projects
- Inquiry in Go-Lab
- Good examples of STEM, geography and math labs and ILSs
- Introduction to Graasp and its functions



After the completion of this session, participants were expected to be able to use Golabz for finding labs and ILSs to use. Moreover, participants have understood the basic functionalities of Graasp and have spent one hour into either personalizing an existing ILS or creating their own.

**Figure 16. Pre-service teachers' training in Haifa**

#### *Next-Lab training as part of the academic course "STEM teaching skills and methods".*

This Next-Lab training took place in the Faculty of Education, on 25<sup>th</sup> June 2017, during a course focusing on good quality web-page platforms in Science education. The training was attended by a mixed group of 20 pre-service and secondary STEM school teachers.

The main parts of the programme, were the following:

- Introduction to Next-Lab
- Demonstration of good ILS and labs
- Learning how to create your own ILS

A number of materials from the Summer School have been translated and reused:

1. Materials about different scenarios which teachers tried before developing their own ILS.
2. ILS on “organ donation & trade” which was used as an example to Jigsaw scenario. In this case; teachers participated as students and did the activities of this ILS themselves, before they developed their own ILS.
3. Evaluation of different apps. One activity included the evaluation of apps allowing them to understand the added value of them.
4. Graasp functions.
5. STEM theory: Next lab supports interdisciplinary learning and inquiry.

#### *Web-based learning environments” course*

The training course under the name “Web-based learning environments” took place at Haifa, Israel and was attended by 20 Israeli and 10 Chinese pre-service teachers. After the completion of the two-hour course, participants were expected to increase their understanding on the use of online laboratories and be in a position to use existing laboratories and ILSs. The importance of collaboration and teamwork peer assessment was also highlighted. The materials used were the same as the ones described in the previous training.

One more pre-service teachers’ training will be organized in Israel in the following three months. The above described agenda in combinations with the resources has worked well and positive feedback has been received so no big changes are expected on that front. At the same time and depending on new Graasp developments, adaptations might be made on the presented ILSs and resources. Particular focus will be given on ILSs targeting primary school teachers in an attempt to reach out to that audience as well.

### **2.4.12 Other Training Activities**

In the period between January and July 2017 Next-Lab Expertise Center in Spain has also acted as an agent delivering the Go-Lab ecosystem on international level. In the frame of this action the University of Deusto team organized a 2-day workshop at Borys Grinchenko Kyiv University, the oldest and most famous Ukrainian Teachers Training Institute. The workshop was continued with an online webinar.

#### **2.4.12.1 Overview**

On 21 and 22 April, 2017, the 2-day event was conducted at Borys Grinchenko Kyiv University, Kyiv, Ukraine. The strong support in organization was provided by Nataliia Morze, Vice-Rector on Informational Technologies. It was the first presentation of the Go-Lab ecosystem in this country; because of this, the on-site format of the workshop was chosen in first place. The main target group was STEM in-service teachers. No special selection was performed. As a result, the participants’ occupations covered all spectrum of education system including teachers, instructional design developers, representatives of Centers for Education Innovations, members of the committee on the professional development of in- and pre-service teachers. The materials and structure of workshop were designed and applied as for Go-Lab ecosystems beginners.

Although the interface of the Go-Lab’s authoring tool (graasp.eu) was in English, the materials, scientific and development terminology, and some of the Go-Lab interactive apps were translated in Ukrainian.

### 2.4.12.2 Brief Description of Training Events

The action in Kyiv included 2 days face-to-face workshop in April 2017 and an online one in June 2017. Twenty-five teachers have been participated in these sessions. The main objective was a) to introduce IBSE as a contemporary pedagogical approach in science education, b) to offer Go-Lab ecosystem as a scaffold for inquiry-based learning in STEM teaching; c) to train teachers to use and adapt existing ILSs and to design their own ILSs using Go-Lab/Next-Lab resources, features and tools.



**Figure 17. Workshop in Kyiv, Ukraine, April 2017**

In the first session hour different models of the inquiry were presented. During the first 30 minutes teachers were working in 4 groups on creating of the set of inquiry in the classroom keeping in mind that practical work should be performed by students. At the end of this activity, each group presented their work; and each participant evaluated the presented lesson's activity using a specially

designed Google Form. The most interesting topic according to the teachers' votes was the ILS called "Why pommes frites are sweet?".

The second part included a demonstration and testing of available ILSs (Inquiry Learning Space) created by other European teachers, virtual and remote laboratories accessible from the Go-Lab platform (<http://www.golabz.eu/>), interactive apps, Help instruments (text and video instructions), Community tools, and so on.

The third part was devoted to the explanation and practicing by teachers of the Graasp - Go-Lab authoring tool ([graasp.eu](http://graasp.eu)). For this purpose, the participants created accounts at the Graasp. The attendants used different devices such as PC, laptops, tablets, and smartphones. In order to reach the objective, which was to get familiar with the Go-Lab ecosystem, teachers created the test ILS using the main apps, such as the Hypothesis Scratchpad, Experiment Design Tool, and Concept Mapper. Since developed during this workshop ILSs were only for training purposes, no ILS was published on the Go-Lab platform to share into the Next-Lab community. During the online webinar, the functionality and usage of ILS Apps such as Experimental Error Calculator, Data Viewer, Reflection Tool, etc., and for learning analytics were presented.

The materials developed over Go-Lab and Next-Lab projects by consortium, e.g. 5 phase inquiry cycle schemes, were used and adopted for the presented event. Overall, after the workshop the participants have gained skills to use existing ILSs, to update and adapt the chosen ILSs, explore online laboratories and validate and incorporate picked Apps in their ILS.

### 2.4.12.3 Conclusion / Outlook

The participated teachers have shown a huge interest, enthusiasm and engagement for the Go-Lab ecosystem. In order to make accessible the Go-Lab ecosystem to broad audiences of teachers and students, all instruments and functionalities should be available in national languages. The teachers are eager to include ILSs in their lessons plans.

The participants noted that the Go-Lab ecosystem was powerful, with large variety of resources and tools, with reasonable structure and easy to be used. Moreover, the teachers

mentioned that additional training was required in order for them to be time efficient in a production of the learning spaces and using the provided tools and Labs & Apps. Based on the received experience, the 3-day workshop suggested that beginners could have reached learning objectives entirely. We will continue to introduce Go-Lab for the science education curriculum in different geographical communities promoting new features of the Go-Lab ecosystem, the IBSE pedagogical approach and 21st century skills applications. This suggests close communication and cooperation with the Ministry of Education and Teacher Training Institutions in the country.

### 3. Teachers Empowering Facilities in Graasp

This section presents a brief overview of functionalities developed in Graasp to support teachers in the first months of the project, as an update of the content already introduced in D2.1. D2.3 will offer a detailed explanation of the rationale and the efforts done to support the management of the on-line community and creation, personalization, awareness, assessment and reflection (Task 2.1 and 2.2).

#### 3.1 Creation and Personalization

During the first six months of the project, the main goal was to provide facilities to support NECs, Go-Lab Ambassadors, and Expert Teachers (see. D1.1) in the creation, personalization and management of the events. The developments done to support the community and the management of training and dissemination events have 3 main goals: provide access to the teachers trained or subscribed to the mailing lists; keep systematic record of the teachers participating in the training or dissemination; and ensure data security and privacy. By August 26th, in the Go-Lab community we had registered 60 events all over the world, reaching 352 registrations in these events. In addition, 328 users from 42 different countries had joined the community with the following profiles:

**Table 1. Profiles of Go Lab community users**

primary education teacher	lower-secondary education teacher	upper-secondary education teacher	higher education teacher	other kind of teacher (e.g., teacher trainer, vocational education teacher, ...)	other roles (e.g., parents, app/lab provider, ...)
73	95	115	71	51	36

Regarding the creation and personalization facilities devoted to teachers, Graasp has included the following extensions:

- Co-authoring: the collaboration is promoted in two different ways. First, offering the possibility to add "similar teachers" to a certain space. Second, enabling the communication between teachers and students at the phase level by means of discussions.
- Progress recognition: visualization of the spider graph in the user profile, analysing the user from different perspectives (namely influencer, sharer, collaborator, contributor, commenter, and visitor) ) in a 7-point scale of experience or skill.
- Data management: At the community level, users are able to opt-in and opt-out at any point. At the space level, instead of activating the data tracking by default, users are able to decide whether they want invite the learning analytics tool "Angela" or not when an ILS is created. Moreover, whenever a new app is added and it requires data tracking, a message is shown to the user notifying the need for data tracking in order to have a fully working app. The same applies when Angela is removed from an ILS. When this request is detected, users are informed about the impact that it may have on the apps.

### **3.2 Awareness, Assessment, and Reflection**

To support awareness, assessment, and reflection, a number of tasks have been done in T2.2. More concretely, our work has focused on the following areas:

- Participatory design of awareness, assessment and reflection tools: in collaboration with T4.4, we have reviewed the existing learning analytics apps to better understand their added value for the teachers and to identify needs to be addressed. The results of this participatory design session will be presented in D2.3 and D4.1.
- Interoperability: ensuring graceful degradation of features according to the privacy configuration and the available services.
- Awareness and reflection promotion: providing teacher and student dashboards with recommended apps attending different purposes (e.g., awareness and reflection related to the whole learning space or to specific apps).
- Assessment support: enabling the assessment of the students' work by supporting the dialogue between teachers and students (e.g., via communication channels and dedicated apps enabling teachers to give feedback).

### **3.3 Help-desk and Support Activities – The Intercom Platform**

In the first months of Next-Lab, the main focus of the team of task 2.3 was to establish, test and master the use of the Intercom platform<sup>2</sup>, a widely-used online facility for managing users' support requests. The main functions and features of the platform were already presented in detail in deliverable D2.1. The following section will report the first results and experience in running this service and briefly assess the advantages and disadvantages and to which extend Intercom served its intended purpose.

First, we will present a summary of the use of the system from its publication mid-May 2017 to the end of the period for this report (July 2017). Following the statistics, we will present an initial assessment of the success of the Intercom service for Go-Lab and how the use of the service could be improved over the coming months.

#### **3.3.1 Use of Intercom - Statistics**

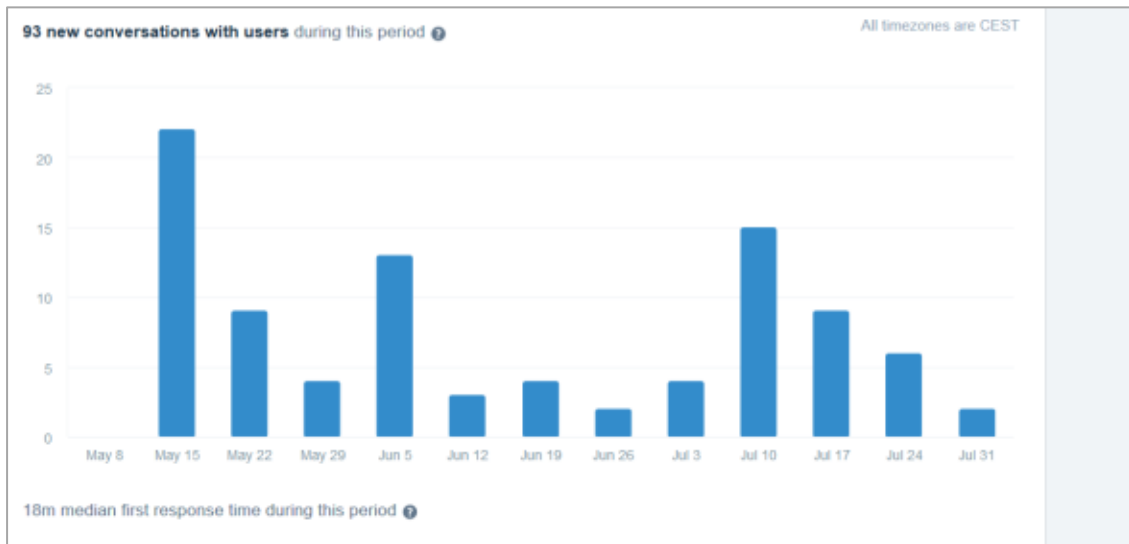
The platform was integrated into the Golabz and Graasp websites in April 2017, and made public to users and visitors of the Go-Lab ecosystem from mid-May on. Therefore, the time period for the reporting was chosen to be from 14 May 2017 until 31 July 2017.

##### **3.3.1.1 Number of Conversations**

Overall, there have been 93 new conversations with users during this period, out of which 96.8% of all inquiries were answered (3 remained unanswered – these inquiries came from users that were blocked because of inappropriate content). The figure below provides an overview of the distribution of inquiries per week over the chosen period of time for reporting. There have been over 20 new conversations in the very first week of making the service public, which has to be partially attributed to the fact that also consortium members and Next-Lab Ambassadors were testing the functions and communication. Intercom was also presented to the Go-Lab Ambassador during their inception workshop beginning of May 2017.

---

<sup>2</sup> <https://www.intercom.com/>

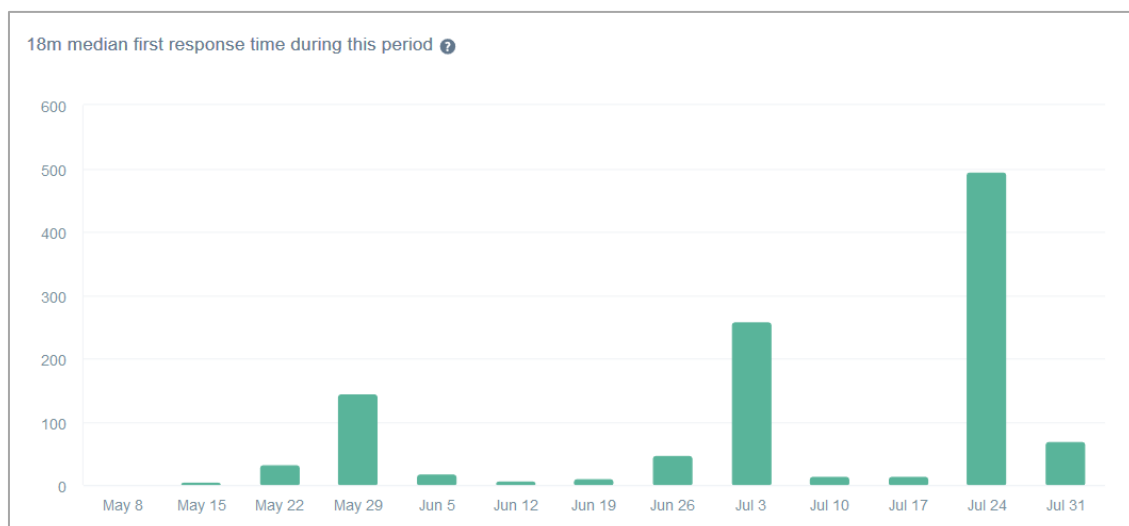


**Figure 18. Number of new users per month from May to June 2017**

The second notable peak was the second week of July 2017, where the service was again introduced to and also used by participants of the Next-Lab Summer School 2017, taking place in Marathon, Greece from 9-14 July 2017.

### 3.3.1.2 Response Time

The **median response time** over the chosen period was 18 minutes, meaning that 50% of all inquiries were addressed within 18 minutes or less, while the other 50% took a longer period to get a first reply from one of the Help-desk team. The extraordinary peaks in the statistics seen in the Figure 19 are usually due to inquiries received on Friday afternoon or during the weekends, where the Help-desk service usually is not being active. Because an inquiry is only considered as attended to once the first reply from the Help-desk team has been made, even if the inquiry is received outside working hours, the statistic shows peaks of several hundreds of minutes. However, within the working week and time, the average response time is well below 5-10 minutes, thus coming close to our goal to offer a direct support to users.



**Figure 19. Median response time to requests between May to July 2017**

### 3.3.1.3 The Help-desk Team Performance

In the given period of May to July 2017, at most 52 people were registered and invited to be part of the Help-desk team. Initially, these include Ambassadors and project partners. Among the 52 people, 15 have full access (i.e., these are partners from EPFL, IMC, NUCLIO, or EA), the others having restricted access (Intercom app settings, Intercom members and Intercom billing can't be accessed). However, it became clear quite soon that not so many people were needed to address all the inquiries, and the number of non-English speaking inquiries are far lower than anticipated. As it turned out, a small team consisting of up to 10 people proved to be the most effective way to manage the service.











Teammate performance		
See how every member of your team is doing		
TEAMMATE	# REPLIES	# CLOSED
 Jens Koslowsky	392	292
 Matthias Heintz	60	40
 Adrian Holzer	32	5
 Pablo Orduña	14	7
 José Gonçalves	10	20
 María Jesús Rodríguez-Triana (Chus)	8	5
 Denis Gillet	7	0
 Eleftheria Tsourlidaki	5	4
 Vidal	4	1
 Alex Wild	4	2
 Rosa Doran	3	0
 Eugenia Kypriotis	3	0
 Ton de Jong	2	0
 Evgenij Myasnikov	1	0

Figure 20. Team members most active on Intercom

### 3.3.1.4 Geographical Coverage

Unfortunately, Intercom does not allow to distinguish or extract the information from where the service requests were received. However, it tracks from which region of the world users of Go-Lab are visiting the websites. Clearly most users that are being recognized by the Intercom platform are based in Europe, but there is also significant use of Go Lab in North America and South-East Asia.





**Figure 21. Geographical distribution of Intercom requests**

The requests received do reflect this allocation of users. Most of the requests came from people based in Europe, followed by users from the US and India as well as Singapore.

### 3.3.1.5 Type of User Requests

As “tags” to users and messages have not been applied, Intercom does not allow to extract statistics about the type or content of the messages received in specific period. It is also not possible to sort the messages in the inbox by users, country, time, browser location or topic. Also, it does not seem possible to get quantified information how many messages were sent over the instant chat and how many users used the connected email addresses for help services. Even when applying tags to messages, the tag function does not help well to provide information that could quantify the types of messages or questions received. Consequently, we cannot provide exact numbers about the type of messages received for certain topics. However, based on our experience the following observations can be made:

- The vast majority of new conversations are triggered through the appearance of the welcome message that users will see when they enter Golabz or Graasp for the first time. The pop-up message contains the following text: "Hi ?? - Have a look around! Let us know if you have any questions. Our team is here to help." Many users feel encouraged to answer to the welcome message by saying "hi" or "no" (i.e. they don't have any questions). However, each of those replies count as a new conversation, and require an answer from the Help-desk side in order to not appear as unanswered the overall statistics.
- Most of the messages that users deliberately sent via email or through the chat, were about reporting technical problems with the Go-Lab ecosystem. Other challenges to overcome were of a rather technical nature, e.g., about the use of different browsers, special characters (e.g. Portuguese), lost passwords for their account or similar problems regarding the log in, etc.
- Another significant category of user requests concerned request for support to find suitable specific subject-related ILS, labs or apps for a given subject. Usually, these users were teachers looking for a lab that could be used to demonstrate a certain scientific problem or occurrence (e.g. in August 2017 we received several requests

from teachers in the U.S. to single out a lab that could be used to demonstrate the sun eclipse).

- Some of the received messages reported non-functioning links or labs of 3rd parties that had stopped the support of these labs. Other messages asked for help in how to use 3rd party labs and tools.
- There were some (internal) recommendation and suggestions about new labs or other ideas for improvements of the Go-Lab ecosystem (new functions, new links, etc.)
- Inescapably, the help-desk team has also received a few inappropriate or offensive messages and pictures. However, the amount of spam messages is far below the number we originally feared to receive. Up to July 2017, only 27 users were blocked.

### **3.3.2 Lessons Learnt**

Originally, the project team chose Intercom based on the assumed need of direct support for the user community as well as the identified requests and demands of the project team to have the following options:

- Access to all submitted questions to be available at all times;
- An option for flagging questions as resolved or not and who answered each question;
- Archiving and retrieving questions and answers (using keywords and/or topics)
- Automatic e-mail notification of corresponding help-desk collaborators
- Option of assigning rules to different help-desk collaborators.

The Intercom software and service addresses all of the above-mentioned requirements very well:

- All submitted questions are stored in the inbox and are available at all time.
- Intercom offers a ticket system, where an inquiry can be assigned to several team members and followed up until the issue is resolved.
- Key words (tags) can be applied to users or specific questions or discussion, enabling thus for all help-desk team members to find the conversations through the search function.
- Team members can be notified by email or SMS if a message has been assigned to him/her, or if this person is mentioned in the (internal) discussion.
- Rules have been put in place to automatically assign specific team members to specific user requests (e.g. if the message is written in a language other than English).

From a user perspective Intercom also seems to be an important step forward to offer direct assistance and help. However, currently this service is rather used as a technical helpdesk, whereas we hope that in the long run more teachers will use the Intercom service also as a service helpdesk, i.e. asking for reviewing of ILs, etc. Also, the number of received inquiries is still less than expected. However, we do expect more requests and questions to be posted to the team with the start of the new school year.

One of the most important lessons learnt was the internal organization of the help-desk team. Originally, the idea was to have many members from all Next-Lab partners as well as the 17 ambassadors to become the core team behind the service. However, it quickly became obvious that it is ineffective to have too many persons involved. Currently, EA has the lead of the Intercom Help-desk, providing the point of first contact. It has proven to be highly efficient to have someone to sort out the request and assign the message then to the person most suited to answer to the problem.

One challenge is that most of the users approaching us are not logged in to Graasp when posting their question and are not willing to provide an email to receive the reply. This often leads to the result that the answer of the help-desk team is not being seen, because the users have closed their browser window or moved on to a page outside the Go-Lab ecosystem.

Last, but not least, teachers are often preparing lessons in the afternoon or on weekends. Currently, Next-Lab is not offering direct support outside normal office hours. Instead of needing assistance with Golabz to prepare or implement ILS during school hours, teachers seem to be working on the Go Lab ecosystem to create ILS rather in the late afternoon / early evening or during the weekends or holidays. In the upcoming months, the project team will evaluate the options to overcome these limitations.

## 4. Conclusion and Outlook

The Next-Lab project and most of its partners are in an advantageous position: they can build on an already well-established user community that was carefully set-up and enhanced during the four years of its predecessor, the Go-Lab project. Many partners have established strong links to the teachers' communities in their country and across Europe and have identified those teachers that are interested in using innovative tools and practices such as Go-Lab. The reports from each NEC and country shows that partners are working with motivated, interested teachers that are eager to improve their teaching skills and are open to new tools, technologies and opportunities such as Go-Lab that will strengthen the scientific profile of their students.

Having experienced partners and a well-established user base has clearly helped and is one of the main reasons that in only 7 months of the Next-Lab project, already numerous trainings have taking place, which were targeting a broad scope of the Next-Lab target audience (new teachers, pre- and in-service teachers, experienced, inexperienced, etc.) and which were covering all important domains and aspects of the Go-Lab ecosystem. In some countries, there are even increased efforts to establish a more strategic approach for providing Go-Lab training, e.g. by organizing courses in cooperation with their ministries of education.

However, there are differences in the training objectives and learning needs among the Next-Lab NECs and countries. More specifically, while the overall goals for all countries is to broaden and enhance the user base of Go-Lab, in some countries (among others Finland, Portugal, Greece) the focus has shifted to also deepen the expertise and user profiles of the existing teachers and communities. Only teachers that have been extensively trained in all aspects and are being supported during their implementation in classrooms can achieve such expertise that they are confident enough to act as an Expert Teachers, and thus become an effective multiplier who is training peers and colleagues in the use of Go-Lab.

We believe that in order to provide more targeted, custom-made and improved training and support, each NEC or Go-Lab Ambassador must be enabled to provide a complete Go-Lab training course that covers all aspects and expertise levels of the Go-Lab ecosystem, i.e. covering technical and pedagogical elements, features and services. At this point, there is no commonly defined Go-Lab curriculum, competence framework and connected training material. Additionally, and because of that, there are no consistent training objectives defined among Next-Lab partners, which highlights the importance to create a commonly produced framework and shared training materials based on a modular and thus flexible workshop concept. Having such an approach, each NEC will be able to combine and create the best possible training program for their teachers and expertise level, while at the same time ensuring that all crucial skills and competences are being addressed. All training providers should be given the tools to offer a targeted, customizable, but complete Go-Lab training material, based on a common curriculum that can be easily adopted to the specific target groups and needs.

To achieve this, one of the most important steps towards developing a complete Go-Lab curriculum and training is to define the competences and skills that need to be addressed for the various proficiency levels of the identified Go-Lab user profiles. In the coming weeks and months of the project, emphasis will be given to develop this framework. Following that, the existing training material will be reviewed and gaps identified, that will then be filled. The creation of a framework will also help defining common training objectives and goals for

each event, also supporting the impact assessment and evaluation, whether training has been effective or not.

The future, upcoming international training events such as winter or Summer Schools are good opportunities to update, enhance or create new content for training. They are planned as training events that are being supported by most of the Next-Lab partners, either by producing new workshops materials or by running a workshop. As each course will have a distinct thematic focus, these events can serve as an opportunity to create training material that can then be used by all.

In parallel, the technological functions that facilitate and support training, community building and personalization will continue to be developed and enhanced, including better support through a direct help- and service desk for users of Graasp and Go-Lab.

## **5. Annexes**

### Overview of all Training Events from January to July 2017

Country	City	Date of Event	Audience	Participants	Type of Training Event	Go-Lab Training Domain(s) Covered	Agenda / Structure of Workshops / Programme
Belgium	Brussels	5-7/05/2017	International Secondary School Teachers	62	Workshop (2-3 days)	More than one (see agenda description)	<a href="http://files.eun.org/SPWatFCL14/SPWatFCL14_May_2017_Scientix-Next-Lab-programme_vPost.pdf">http://files.eun.org/SPWatFCL14/SPWatFCL14_May_2017_Scientix-Next-Lab-programme_vPost.pdf</a>
Cyprus	Nicosia	23/01/2017	Local Secondary School Teachers	11	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Presentation about the Next-Lab project, demonstration of the Go-Lab portal and Graasp with parallel hands on activities
Cyprus	Nicosia	31/01/2017 & 7/02/2017	Other	22	Workshop (2-3 days)	Go-Lab Ecosystem (Graasp / Golabz)	Go-Lab portal repositories, graasp, ILS creation, ILS submission process
Cyprus	Nicosia	06/02, 8/02, 09/02, 5/02, 16/02/2017	Other	45	Workshop (2-3 days)	Go-Lab Ecosystem (Graasp / Golabz)	Go-Lab portal repositories, graasp, ILS creation, ILS submission process
Cyprus	Nicosia	04/07/2017	Local Secondary School Teachers	25	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp. Creation of an example of an ILS.
Estonia	Tartu	16/03/2017	Local Primary School Teachers	27	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Training and feedback on teacher created ILSs
Estonia	Tartu	24/05/2017	Local Primary School Teachers	10	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Training and feedback on teacher created ILSs
Finland	Helsinki	22/05-25/05/2017	Local Secondary School Teachers	10	Workshop (2-3 days)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp. Creation of an example of an ILS.

Country	City	Date of Event	Audience	Participants	Type of Training Event	Go-Lab Training Domain(s) Covered	Agenda / Structure of Workshops / Programme
France	Paris	-	Local Secondary School Teachers	23	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to Go-Lab portal and services + ILS creation
Greece	Athens	24/05/2017	Local Secondary School Teachers	30	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Intro to Go-Lab portal and services
Greece	Marathon	09-14/07/2017	International Secondary School Teachers	25	International Training Event	More than one (see agenda description)	<a href="http://nextlab.ea.gr/sites/default/files/nextlab_programme_2017.pdf">http://nextlab.ea.gr/sites/default/files/nextlab_programme_2017.pdf</a>
Netherlands	Enschede	07/02-04/04/2017	Pre-service Teachers	23	Course (3+ days)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp. Creation of own ILS in the following weeks.
Netherlands	Utrecht	17/5/2017	Local Primary School Teachers	4	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Short presentation and lots of hands-on
Netherlands	Gorinchem	17/1/2017	Local Secondary School Teachers	25	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Workshop as part of a local conference
Portugal	Lisbon	04/01/2017	Local Secondary School Teachers	18	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp
Portugal	Lisbon	21/01/2017	Local Secondary School Teachers	25	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Presentation of the project
Portugal	Lisbon	11/02/2017	Local Secondary School Teachers	22	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp
Portugal	Lisbon	22/02/2017	Local Secondary School Teachers	22	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp
Portugal	Lisbon	25/02/2017	Local Secondary School Teachers	22	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp



Country	City	Date of Event	Audience	Participants	Type of Training Event	Go-Lab Training Domain(s) Covered	Agenda / Structure of Workshops / Programme
Portugal	Madeira	23/02 - 01/03/2017	Local Secondary School Teachers	15	Series of Workshops	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp
Portugal	Lisbon	04/03/2017	Local Secondary School Teachers	23	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp
Portugal	Lisbon	11/03/2017	Local Secondary School Teachers	18	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp
Portugal	Lisbon	25/03/2017	Local Secondary School Teachers	18	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp
Portugal	Lisbon	01/04/2017	Local Secondary School Teachers	25	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp
Portugal	Alqueva	08/04/2017	Local Secondary School Teachers	15	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp
Portugal	Lisbon	22/04/2017	Local Secondary School Teachers	23	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp
Portugal	Porto	22/04/2017	Local Secondary School Teachers	15	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp
Portugal	Coimbra	22/04/2017	Local Secondary School Teachers	20	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp
Portugal	Lisbon	11/05/2017	Local Secondary School Teachers	23	Workshop (2-3 days)	Go-Lab Ecosystem (Graasp / Golabz)	Hands-on activities on how to create an ILS
Portugal	Terceira	23/07/2017	Local Secondary School Teachers	15	Workshop (2-3 days)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to IBSE, hands-on interdisciplinarity, research methods in classroom, astronomy, Go-lab methodology, Graasp, creation of an ILS

Country	City	Date of Event	Audience	Participants	Type of Training Event	Go-Lab Training Domain(s) Covered	Agenda / Structure of Workshops / Programme
Spain	Bilbao	Jan-March 2017	Local Secondary School Teachers	6	4 Workshops	Pedagogy / IBSE	Training on IBL and use Go-Lab instruments to design ILS (at least 2 ILSs /teacher)
Spain	Barcelona	09/02/2017	Local Secondary School Teachers	30	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Presentation plus brief hands-on practice of the design simple ILSs
Spain	Bilbao	15/06/2017	Local Secondary School Teachers	20	Webinar / Online workshop	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to Go-Lab portal and services
Spain	Bilbao	15/06/2017	Local Secondary School Teachers	6	Webinar / Online workshop	Go-Lab Ecosystem (Graasp / Golabz)	Presentation of Next-Lab and Go-Lab ecosystem, including the Inquiry approach
Spain	Barcelona	10-13/07/2017	Local Secondary School Teachers	30	Workshop (2-3 days)	Go-Lab Ecosystem (Graasp / Golabz)	Get familiar with IBSE, create at least one ILS using chosen online laboratory
Ukraine	Kyiv	20-21/04/2017	International Secondary School Teachers	25	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Introduction to the Go-Lab portal and Graasp
United Kingdom	Leicester	27/02/2017	Pre-service Teachers	12	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Intro to Go-Lab & Next-Lab (PPT); demo + try out Craters ILS; Demo + explore portal; evaluation of modelling tool (worksheet); demo of authoring; practice with authoring; wrap-up and feedback (questionnaire).
United Kingdom	Leicester	13/06/2017	Teacher Trainers	2	Workshop (<1 day)	Go-Lab Ecosystem (Graasp / Golabz)	Intro to Go-Lab portal and services + use of scenarios + publishing process + feedback

### ***Initial Allocation of Workshop Material Development for 1st Next-Lab Summer School***

<b>Domain</b>	<b>Workshop</b>	<b>Learning goal(s)</b>	<b>Associated Next-Lab task</b>	<b>Partner</b>
<b>Communication / Dissemination</b>	<b>Multiplier</b> How to become an effective Next-Lab multiplier	<ul style="list-style-type: none"> <li>- Enable participants to organize engaging workshops in their region to train peers in the use of Next-Lab</li> <li>- Learn how to motivate peers to use Next-Lab</li> </ul>	Task 1.2 - Teachers	EUN
<b>Pedagogy</b>	<b>IBSE I</b> IBSE and beyond (e.g. Innovative pedagogies and tools: multi-media learning theory, using videos, cognitive load theory, flip the classroom, TPACK, gamification, collaborative learning, feedback, etc.)	<ul style="list-style-type: none"> <li>- Importance of inquiry based learning for students and teachers</li> <li>- Learn about additional learning / teaching strategies that support IBSE</li> </ul>	Not connected with a specific Next-Lab task	ENS
	<b>IBSE II</b> Spreading the word on Inquiry: How to introduce inquiry to peers and identify opportunities for classroom integration	<ul style="list-style-type: none"> <li>- Techniques and approaches on how to effectively introduce inquiry to peers.</li> </ul>	Not connected with a specific Next-Lab task	EA
	<b>Pedagogy I</b> Innovative learning approaches: The Big Ideas of Sciences as a chance to apply interdisciplinary learning	<ul style="list-style-type: none"> <li>- Understanding the potential of Next-Lab and the Big Ideas of Science for classroom teaching</li> <li>- Present opportunities to integrate inquiry in the class aligned with national curricula</li> </ul>	Task 1.6 - Lining up with national curricula	EA

Domain	Workshop	Learning goal(s)	Associated Next-Lab task	Partner
	<p><b>Action Workshop</b></p> <p>"Pimp my ILS" - Working in groups to improve existing ILSs to facilitate exchange of ideas and strategies</p>	<ul style="list-style-type: none"> <li>- Practical work on refining ILSs and proposing targeted changes. Teachers will be given an "average" ILS which they will be invited to upgrade but also use it as a sandbox throughout the course to test new things and tools</li> <li>- Provide opportunities for <b>co-creation</b> of Next-Lab learning spaces</li> </ul>	<p>Task 2.3 - Tutoring</p> <p>Task 2.4 - Networking and training</p>	NUCLIO
Go-Lab Ecosystem	<p><b>New Features and Services I</b></p> <p>Labs and apps</p>	Presentation, testing and understanding the optimum use of new features by users	Task 3.5 - Labs and Apps	UTE
	<p><b>New Features and Services II</b></p> <p>Optimum use of the new Next-Lab tools (collaboration, feedback, monitoring, ePortfolio, self- and peer assessment / dashboard, modelling app)</p>	Presentation, testing and understanding the optimum use of new features by users	<p>Task 3.1 - 21st century skills</p> <p>Task 3.3 - ePortfolio</p> <p>Task 3.4 - Modelling</p>	UD
	<p><b>New Features and Services III</b></p> <p>Professional Learning Spaces - Introduction &amp; Presentation</p>	Presentation, testing and understanding the optimum use of new features by users	Task 2.5 - Co-created learning spaces	UTU
	<p><b>New Features and Services IV</b></p> <p>The Next-Lab coaches and mentors - Goals, functions and tools</p>	<ul style="list-style-type: none"> <li>- Understanding the new service and functions of the support mechanism</li> <li>- Being able to act as a Next-Lab coach &amp; mentor</li> </ul>	<p>Task 4.1 - Tutoring Platform</p> <p>Task 2.3 - Tutoring</p>	NUCLIO / IMC

Domain	Workshop	Learning goal(s)	Associated Next-Lab task	Partner
21st Century skills and assessment	<b>21st Century Skills I</b> Introduction to 21st century skills - Why are they important and how can Next-Lab support them?	<ul style="list-style-type: none"> <li>- Understanding of the importance and relevance of 21st century skills for students</li> <li>- Understanding the new role of the teacher in facilitating 21st century skills</li> </ul>	Task 3.1 - 21st century skills Task 3.3 - ePortfolio Task 3.4 - Modelling	EA
	<b>21st Century Skills II</b> Awareness, assessment and reflection Apps and tools for teachers in Next-Lab How can teachers understand the learning analytics of Next-Lab students?	<ul style="list-style-type: none"> <li>- Understand how Next-Lab features can be used to facilitate the 21st century skills</li> <li>- Knowing how to use the Next-Lab tools for assessing skills (for both, students and teachers)</li> </ul>	Task 3.2 - Self- and peer assessment Task 2.2 Awareness, assessment, and reflection	UCY

# Application Form - Summer School 2017

Dear teachers,

The NEXT-Lab summer school 2017 is designed for you, the practitioners, building upon the proven good practices and knowledge of your teaching skills and use of the Go-Lab system.

With this application we are inviting those teachers eager to improve and develop their skills and competences in the use of the Go-Lab system and that are dedicated to promote its use to join us to reach a high level of expertise in using online and remote labs in science education.

Are you interested in joining a group of outstanding teachers? Do you want to learn and share your experience in using Graasp and Go-Lab? Then join us and share with us your experience and help us design the platform and its features to make it fit to your needs!

The summer school will take place in Marathon, Greece from 9-14 July 2017.

Learn more about the programme and the location here: <http://nextlab.ea.gr/>

The application form consists of 4 sections:

- 1) Basic contact information
- 2) Your Experience with Graasp / Go-Lab (3 Questions)
- 3) Your (past & future) Participation in Go-Lab / Next-Lab (2 Questions)
- 4) Past Go-Lab / Next-Lab training & support (2 Questions)

Please keep your answer as complete but concise as possible. We believe that each question (apart from section 1) should be answered with up to 1500 characters.

Please submit your application no later than 15 May 2017 at 18:00h CET.

On the basis of your answers the NEXT-Lab team will choose the participants for this year's Summer School. All participants will be notified.

Thank you so much for your interest! We are hoping to welcoming you this year!  
GOOD LUCK!

Your NEXT-Lab team.

\* Required

## Applicant information



1. First Name: \*

---

2. **Family Name:** \*

---

3. **City:** \*

---

4. **Country of residence:** \*

---

5. **E-mail:** \*

---

6. **Mobile:**

---

7. **Graasp ID**

---

## Your Experience with Graasp / Go-Lab

Please limit your answer to 1500 characters per question.

8. **When and why have you started using Go-Lab / Next-Lab? How many ILSs have you created and published? (Please share the links with us) \***

---

---

---

---

---

9. **Have you ever implemented any ILSs in your classrooms? Please share your experience! (time / number of implementation, number of students, subject field, integration into the school curriculum, etc.) \***

---

---

---

---

---

10. **Why do you think Go-Lab / Next-Lab is a good tool for science education in schools? What do you find problematic in its use? Describe your personal experience about the advantages but also the disadvantages of using Graasp/ILS in a classroom! \***

---

---

---

---

---

## Your Participation in Go-Lab / Next-Lab

Please limit your answer to 1500 characters per question.

11. **In what way have you been involved in the Go-Lab / Next-lab project activities in the past? How have you personally contributed to advance the use and development of Go-Lab / Next-Lab in your school, region or country? (e.g. participatory design activities, workshops, conferences, training to colleagues, etc.) \***

---

---

---

---

---

12. **How would you like to be involved in future activities in Next-Lab? Do you have any ideas how to promote and contribute to the use of Go-Lab / Next-Lab in your school, region or country? \***

---

---

---

---

---

## Go-Lab / Next-Lab training & support

Please limit your answer to 1500 characters per question.

13. **Have you participated in face-2-face or online training or used the support material on Golabz? Please mention the workshop(s) you have participated in (date and location). Share with us your experience – what was good, what was bad? \***

---

---

---

---

---



**14. Please explain why you think you should participate in a Next-Lab summer course and what do you hope / expect to learn from trainers and other teachers attending? \***

---

---

---

---

---

---

Powered by  
 Google Forms

### Next-Lab

Next Generation Stakeholders and Next Level Ecosystem for Collaborative Science Education with Online Labs



Next-Lab focuses on introducing inquiry-based science education (IBSE) in schools and continues the mission of the project Go-Lab, promoting innovative and interactive teaching methods in primary and secondary schools.

Next-Lab provides a varied portfolio of advanced online learning tools in science topics, which contains hundreds of virtual and remote science laboratories, inquiry learning applications and Inquiry Learning Spaces. Furthermore, there is an authoring tool for teachers they can use to create own cross-curriculum learning scenarios and share them with their students.

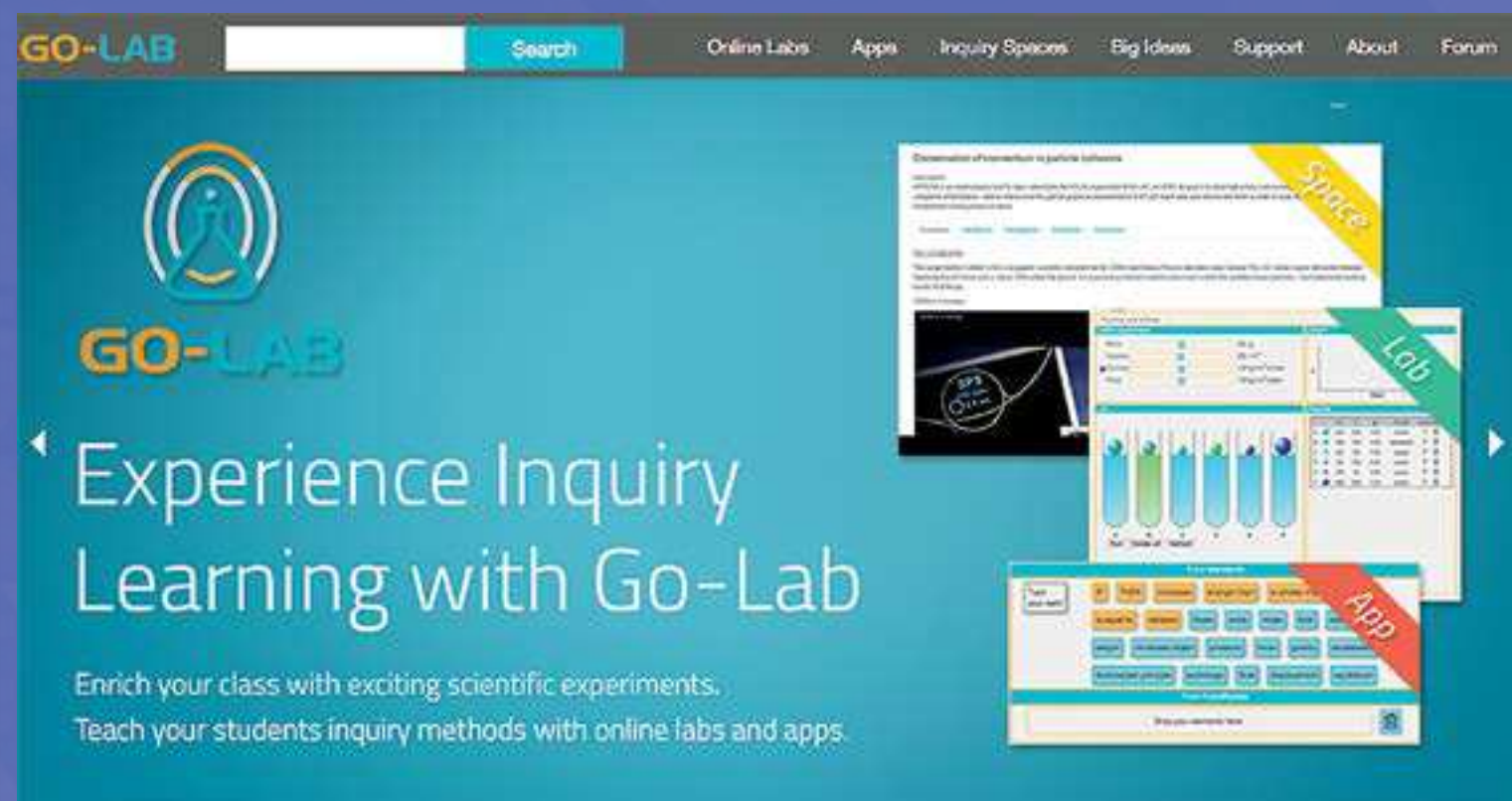
Using Next-Lab, students benefit from the rich, challenging learning experiences, shaping their science and technology knowledge together with social competencies. The innovative tools of Next-Lab guide students through the research process, helping them to acquire in-depth understanding of scientific topics as well as 21st century collaboration and reflection skills.

<http://project.golabz.eu/project>

### The Go-Lab Portal

The Go-Lab Portal offers science teachers an opportunity to create highly interactive and personalised inquiry learning experiences for their students. The Go-Lab Portal offers a unique and broad set of remote and virtual laboratories that form the starting point for Inquiry Learning Spaces (ILSs). In an ILS, an online lab is combined with multimedia material and inquiry learning apps, which are dedicated tools to support inquiry learning processes (such as designing an experiment). The structure of an ILS follows an inquiry learning cycle with dedicated inquiry phases. The Go-Lab Authoring Platform ([www.golabz.eu/](http://www.golabz.eu/)) offers full facilities to create in a very straightforward and easy way personalised ILSs from an online lab or to re-use and adapt ILSs that were created before by other teachers.

<http://www.golabz.eu/>



# Next-Lab:

## Next Generation Stakeholders and Next Level Ecosystem for Collaborative Science Education with Online Labs Summer School 2017



GO-LAB

Programme  
July 9<sup>th</sup> – July 14<sup>th</sup>, 2017  
Marathon, Attica, Greece



The NextLab Summer School 2017 is supported by the NextLab - Next Generation Stakeholders and Next Level Ecosystem for Collaborative Science Education with Online Labs project, that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731685.

ORGANIZED BY



ELLINOGERMANIKI AGOGI



	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
	9 July 2017	10 July 2017	11 July 2017	12 July 2017	13 July 2017	14 July 2017
<b>09:00 to 13:00</b>	<p>Participants' arrival &amp; registration</p>	<p><b>Inquiry Base Science Education An Introduction</b> Ton De Jong <i>University of Twente</i></p> <p><b>The Go-Lab Scenarios Brief Introduction</b> Matthias Heintz <i>University of Leicester</i></p> <p><b>Cognitive Load Theory</b> Ton De Jong <i>University of Twente</i></p>	<p><b>21st Century Skills I Go-Lab Apps</b> Jens Koslowsky <i>Ellinogermaniki Agogi</i></p> <p><b>Workshop Time to Prepare your ILS</b></p> <p><b>21st Century Skills II Awareness, Reflection, Assessment</b> María Jesús Rodríguez-Triana <i>EPFL</i></p>	<p><b>Spreading the Word on Inquiry How to Introduce Inquiry</b> Rosa Doran <i>NUCLIO</i></p> <p><b>Innovative learning approaches: The Big Ideas of Sciences</b> Eleftheria Tsourlidaki <i>Ellinogermaniki Agogi</i></p> <p><b>Workshop Time to Prepare your ILS</b></p>	<p><b>Flipping the Classroom using Go-Lab</b> Jens Koslowsky <i>Ellinogermaniki Agogi</i></p> <p><b>Workshop Time to Prepare your ILS</b></p>	<p><b>How to become an effective Multiplier</b> Anastasiya Boiko <i>EUN</i></p> <p><b>The Go-Lab Scenarios Reflection</b></p>
<b>15:00 to 17:00</b>	<p><b>15:00-17:00 Registration &amp; Opening Presentation of the Programme</b></p> <p>Meet &amp; Greet</p>	<p><b>What's new in Go-Lab?</b> María Jesús Rodríguez-Triana <i>EPFL</i></p> <p>&amp; Jens Koslowsky <i>Ellinogermaniki Agogi</i></p>	<p><b>Workshop Time to Prepare your ILS</b></p> <p><b>The Go-Lab Learning Analytic Apps Reflection</b></p>	<p><b>Visit to the Acropolis Museum and the Acropolis</b></p> <p><b>Dinner</b></p>	<p><b>Presentations of ILS &amp; Discussion</b></p>	<p><b>Participants' departures</b></p>
	<p><b>18:00-20:00 Key Notes</b></p> <p><b>CERN Outreach Opportunities for Teachers and Students</b> Sascha Schmelting, <i>CERN</i></p> <p><b>Students at the Centre of Classroom Innovation</b> Rosa Doran, <i>NUCLIO</i></p> <p><b>Open Schools for Open Societies</b> Sofoklis Sotiriou, <i>EA</i></p>	<p><b>Visit at Cape Sounio, Sanctuary of Poseidon Dinner</b></p>			<p><b>20:00h Farewell Dinner</b></p>	

**Visit to Cape Sounio, Sanctuary of Poseidon**  
(July 10<sup>th</sup>, 18:00 – 23:00)



Cape Sounio is a promontory located 69 kilometres from Athens, at the southernmost tip of the Attica peninsula. According to legend, Cape Sounion is the spot where Aegeus, king of Athens, leapt to his death off the cliff, thus giving his name to the Aegean Sea. The sanctuary of Poseidon, one of the most important sanctuaries in Attica, is also located at Sounio. Archaeological finds on the site date from as early as 700 BC. Herodotus tells us that in the sixth century BC, the Athenians celebrated a quadrennial festival at Sounion, which involved Athens' leaders sailing to the cape in a sacred boat. The later temple at Sounion, whose columns still stand today, was probably constructed in 450-440 BC, over the ruins of a temple dating from the Archaic Period. Poseidon, the "God of the Sea" was considered to be a powerful god, second only to Zeus (Jupiter). The temple at Cape Sounion, was a venue where mariners, and also entire cities or states, could propitiate Poseidon, by making animal sacrifice, or leaving gifts.

**Visit to the Acropolis Museum**  
(July 12<sup>th</sup>, 16:00 – 18:30)



The New Acropolis Museum under the Acropolis of Athens "came to life" when at 2000, the Organization for the Construction of the New Acropolis Museum announced an invitation to a new tender, which came to fruition with the awarding of the design tender to Bernard Tschumi with Michael Photiadis and their associates and the completion of construction in 2007. The Museum has a total area of 25,000 square meters, with exhibition space of over 14,000 square meters, ten times more than that of the old museum on the Hill of the Acropolis. The new Museum offers all the amenities expected in an international museum of the 21<sup>st</sup> century. Permanent exhibitions: The Gallery of the Slopes of the Acropolis, The Archaic Gallery, The Parthenon Gallery, Propylaea-Athena Nike-Erechtheion, from 5<sup>th</sup> century BC to 5<sup>th</sup> century AC.

**Visit to the Acropolis of Athens**  
(July 12<sup>th</sup>, 19:00 – 20:30)



The greatest and finest sanctuary of ancient Athens, dedicated to the goddess Athena, dominates the centre of Athens from the rocky crag of the Acropolis. The most celebrated myths, religious festivals; earliest cults are all connected to this sacred precinct. These unique masterpieces of ancient architecture combine different orders and styles of Classical art in a most innovative manner and have influenced art and culture for many centuries. The Acropolis of the 5th century BC is the most accurate reflection of the splendour, power and wealth of Athens at its greatest peak, the Golden Age of Pericles. In the mid-fifth century BC, when the Acropolis became the seat of the Athenian League, Pericles initiated an ambitious building project which lasted the entire second half of the fifth century BC. The architects, Ictinos and Callicrates, began the erection of this unique monument at 447 BC and the building was substantially completed by 432 BC. The most important buildings visible on the Acropolis are the Parthenon, the Propylaea, the Erechtheion and the temple of Athena Nike.

## Next-Lab Face-to-Face Training Workshop Instructions

### Basic information

<b>Workshop title:</b>	The tangram challenge
<b>Estimated total workshop duration:</b> (max. 3 hours)	1,5 hours
<b>Organization creating workshop materials:</b>	Ellinogermaniki Agogi
<b>Related Next-Lab Task:</b>	N/A
<b>Link to Graasp:</b>	<a href="http://graasp.eu/spaces/5975cc8523bcee3c213a59df">http://graasp.eu/spaces/5975cc8523bcee3c213a59df</a>

### Requirements

<b>Prior Next-Lab / Go-Lab knowledge of participants needed?</b>	No prior knowledge needed
<b>Minimum/maximum number of participants:</b>	The tangram is designed to be used by 18 participants maximum. If more than 18 participants are present, the challenge can still be done, but it is better if they are split into two larger groups and work with a different set of tans.
<b>Special infrastructure needed:</b> (apart from computer and internet access)	<ul style="list-style-type: none"> <li>- 1 printed copy of the Tangram_printouts.pdf file</li> <li>- 6 printed copies of the Tangram_help.pdf file</li> <li>- The Tangram puzzle presentation</li> </ul>

### Workshop structure and organization

<p><b>Rational and objectives</b></p> <p><i>Briefly describe the main topics &amp; objectives this workshop will address. What are the learning goals and the 'theory' you want to cover?</i></p> <p>The tangram challenge is designed with the aim to introduce the added value of interdisciplinary learning using a simple analogy.</p>
<p><b>Workshop details</b></p> <p>This workshop has 3 parts, and 6 participants or 6 teams (ideally of two or three people) are needed in order to do the workshop.</p> <p>In the first part, participants are given 6 pieces of a tangram called tans1 that have the same colour and are asked to create a square. In the analogy, these squares represent the science disciplines.</p> <p>Besides their colour, the tans also have some shapes on them. That is because, if the tans from all 6 tangrams are put together they make up one image. In the second part of the challenge, participants are asked to look closer to all the tangrams and the tans, and see if there is anything on them that indicates that these tans have more to say. Teachers are</p>

## Face-to-face Training workshops instructions

expected to understand that if all the tans are brought together and rearranged they make up a single image. Once they grasp this idea, they are all invited to bring their tans on one table and work together and put the image together. In our analogy, this image represents science as a whole.

In the third part participants reflect on the activity so far and the analogy is presented to them.

For more details on preparation and carrying out of the workshop please refer to document "The Tangram challenge guide for educators.pdf"

## Workshop activities description

Each workshop has 3 main parts:

- A) an introduction and core presentation or demonstration,
- B) a hands-on and minds-on activity, and
- C) a wrap-up activity.

Please provide a small description for each of the parts, so that a trainer / tutor is able to implement the workshops and knows what she/he is expected to do. Provide information so that he/she is aware of the structure, process, and time-plan of the session, as well as what to watch out for and to prepare all the necessary materials that he/she should use.

(Fill free to add pictures from other workshops, print screens or images of the materials if needed)

### Part A – Introduction / Core presentation / Demonstration

**Workshop Instructions:**

Depending on the subject, you might want to prepare a PowerPoint presentation or use alternative means of presentation like a demo directly on the system. Fill free to do it any way you think it is best. If you do a PowerPoint presentation, please use the official Next-Lab template for presentations available in Graasp. This parts should not be more than 30 minutes.

If you want to have one PowerPoint that is used throughout the activity in the “documents needed for this part” please indicate the slides that need to be used in this part.

**Documents/links needed for this part:**

**Estimated time:**

### Part B - Hands-on and minds-on activity

**Workshop Instructions:**

*Teachers always appreciate hands-on activities more than lectures and they are much more engaged in them. Thus, the core of each workshop needs to be a hands-on activity. Depending on the subjects, a hands-on activity can be an activity using the Go-Lab platform or an activity that uses other materials. It may not even need computers. Please describe the activity the tutors should do, how it is connected to the topic of the workshop and what materials they will need to use and prepare. Guidelines for organizing and handling the participants would be helpful.*

**Documents/links needed for this part:**

**Estimated time:**

### Part C - Wrap-up activity

**Workshop Instructions:**

*Every workshop should conclude with a wrap-up part to summarize what was learned, the connection to the Next-Lab/Go-Lab system and/or to the project's main objectives (for example promoting 21st century skills). Please describe here the wrap-up activity you would like tutors to do (could be a conversation, filling in a questionnaire, taking a vote). If any necessary additional materials need to be prepared (like a ppt) you'll need to prepare them.*

**Documents/links needed for this part:**

**Estimated time:**