Equipping the Next Generation for Active Engagement in Science

DELIVERABLE D5.10: Annual Report on Adapters Programme Implementation

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3	26th May 2016	Final version shared with the consortium for feedback	Mario Barajas

CONTENTS

EXECUTIVE SUMMARY

The goal of *D5.10 Annual Report on Adapters Programme Implementation* is to report on the activities carried out by the 11 partners which deliver the ADAPT stage of the ENGAGE professional development programme for teachers. The reporting period is from October 2015 to April 2016.

Following the plan from D5.9, UB has guided partners in delivering the 3 strategies of the ENGAGE CPD model, namely materials, courses and community. The present document reports on the dissemination and networking actions taken place, which include face to face presentations at teacher fairs, conferences, and strategic meetings, among others. Online dissemination actions are reported as well, which have proven to be especially successful in promoting the uptake of ADAPT resources in some countries.

Section 1 provides an overview of ADAPT goals. With respects to ADOPT, ADAPT teachers increase their commitment to including RRI in the classroom. They use advanced ENGAGE materials, which take longer than ADOPT materials. ADAPT enables to explicitly teach RRI skills to students. The five ADAPT materials published are explained briefly, as well as the updates on the Knowledge Hub.

Section 2 accounts for the monitoring process carried out by the University of Barcelona (UB) along the first year of ADAPT implementation, which was based mainly on ASANA and monthly Google Forms. We report on the results of two rounds of monitoring, which enabled to gather best practices by partners as well as to identify challenges and tackle them at an early stage.

Section 3 summarises the results of ADAPT delivery up to date. Results show that 1324 teachers across Europe are part of the ADAPT stage. We report on teachers' feedback about the materials, which they expressed by voting and by publishing comments. Seven online courses for ADAPT have been completed in the first year of ADAPT reaching a total of 159 teachers. Five such courses have achieved or overcome the number of completions required. Besides, we provide evidence to show how partner countries are fostering a community of practice based on mentorship using the guidelines provided by UB.

Section 4 presents selected ADAPT success stories, which refer to teachers or schools in which there is evidence that teachers are using the ADAPT CPD tools in their practice, with the help of the ENGAGE materials.

The deliverable concludes with Section 5, which include the lessons learnt from ADAPT first year implementation. Successful dissemination strategies have been identified, such as the close link between online course dissemination and new users registered in the Knowledge Hub, or showing a preview of the ENGAGE materials to not registered users. This section also highlights challenges such as achieving teacher progression from ADOPT to ADAPT, and possible corrective actions to be undertaken during ADAPT 2nd year.

In the appendixes, supporting materials elaborated by UB are attached, such as strategies to get new ADAPT users, and guidelines for seeding and managing the community of practice. Finally, the data used for the present document is presented by country, as National Reports.

1. OVERVIEW OF ADAPT

1.1. Goals and targets

As stated in *D2.1 RRI guidelines with exemplars for learning materials and teacher training*, ADAPT belongs to deployment phase of ENGAGE. This phase constitutes the rollout of the programme, in which the three stages of teacher professional development (namely ADOPT, ADAPT and TRANSFORM) are implemented.

Each stage corresponds to a Work Package. Led by the University de Barcelona (UB), ADAPT corresponds to WP5, and it is. Eleven partners who are running the engage CPD are contributing to WP5:

- SHU
- FORTH
- FAU
- TRACES
- VUT
- WEIZMANN
- UB
- HiVe
- HEP-PH FR
- LIETUVOS EDUKOLOGIJO
- UNic

The main goal of ADAPT is to support teachers in making a stronger commitment to RRI teaching than in ADOPT, thus explicitly teaching RRI skills to their students. To that goal, they make use of the ADAPT CPD tools, namely problem solving, which is as an advanced version of the ADOPT tool called “dilemma”; and conversation, which builds on to the ADOPT tool “group discussion”.

The objectives of ADAPT are:

- To deliver in each partner country the ADAPT stage of the ENGAGE programme
- To support teachers to make a transition of their practice towards RRI based teaching
- To motivate a proportion of teachers propel from the ADAPT stage to reach the TRANSFORM stage in the progressive staircase of involvement
- To test the model and its impact in year 2, which will be reiterated in subsequent years, and as the basis of subsequent stages (TRANSFORM)

Expanding ADAPT pedagogical tools to include aspects of RRI

ADAPT encourages teachers to explore and acquire a range of RRI skills with their students in an engaging and motivating way. For this reason, particular attention has been put in including aspects of RRI in the pedagogical tools which are provided to teachers at this stage of their professional development.

In the *problem solving tool*, the approach taken is one that enables a repertoire of skills to be explored through games set in familiar contexts, which are then built upon by applying the skills learnt to real-life scientific dilemmas. For example, in the ENGAGE resource **Animal Testing**, students learn how to use different ethical principles to make difficult decisions based on a reality TV show. They later use these same principles to decide whether animals should be used to test new drugs.

In the *conversations tool*, teachers are guided through a range of different techniques to help their students take part in genuine and useful group discussions. One example of a technique used is the fishbowl format. RRI skills developed and explored through the conversation tool, include those that relate to being part of society and having a voice that should be heard.

Key to the learning experience is the notion of creative learning through new ideas. One approach taken by ENGAGE is that of using content that reflects real world situations articulated through stimulating science contexts often in relation to wider societal positions. The dilemma tool outlines what makes a good dilemma in science and how to craft lessons around it. Through taking part in the courses teachers are encouraged to explore the dilemmas and contexts used by ENGAGE materials through a range of different approaches. The interest of the student once gained through scientific issues in context in ADAPT activities such as "2 degrees" (global warming), "E-cigarettes" and "fracking" enables teachers to design their own lessons which allow wider exploration of RRI issues through skills based approaches.

Quantitative targets

From a quantitative perspective, the following targets have been defined for the first period of ADAPT implementation:

Country	Materials usage (new teachers / year)	Online course participation (teachers / year)
Germany	400	25
UK	300	25
France	300	25
Spain	230	20
Romania	100	20
Greece	60	15
Israel	40	15
Norway	30	15
Switzerland	20	10
Lithuania	20	10
Cyprus	10	10

The goal is that 25% teachers in the ADOPT stage propel to ADAPT. Similarly, 25% from ADAPT should join TRANSFORM.

Qualitative targets

Qualitative targets refer to the learning outcomes of the ADAPT stage. This stage builds teachers' skills to use RRI in the classroom with less prescriptive support than in the stage below, i.e. ADOPT. Whereas teachers in ADOPT use ENGAGE materials to practice already taught content, those in ADAPT can start to teach science in an RRI-based way. The learning outcomes or skills of ADAPT are:

1. Teachers will learn practical strategies to explain concepts relating to RRI, such as evidence and ethics.
2. Teachers will learn ways to take into account students' ideas: existing concepts relating to RRI
3. Teachers will be able to PREPARE effective lessons with ENGAGE materials
4. Teachers will identify challenges and SHARE strategies for students, to talk and debate in the Online Teacher's community
   Teachers will be able to assess and COMPARE students' progress
5. Teachers will move to a higher level of expertise as reflective practitioners.

It is assumed that teachers who achieve the aforementioned learning goals will have begun a transition with significant change in their beliefs, knowledge, and/or classroom practice.

1.2. ADAPT activities

In order to achieve the ADAPT quantitative and qualitative targets, 3 activities have been used: a) materials, b) online courses and c) community. These activities constitute the teacher inquiry model, whose goal is to assist teachers in questioning their practice in the light of RRI.

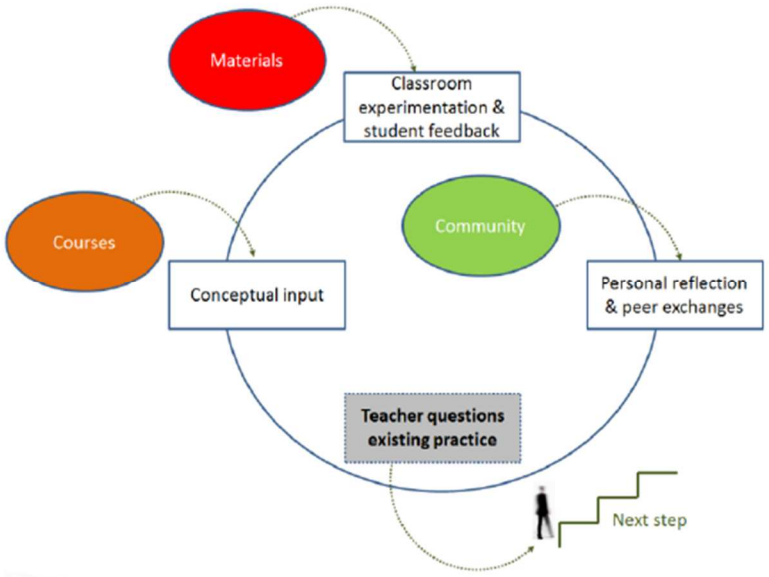


Figure 1: The 3 activities of ADAPT (materials, courses and community)

Materials for classroom experimentation & student feedback

The materials for the ADAPT have been developed by SHU and include a series of lessons. They are longer than those in ADOPT, thus enabling to teach new science content and skills. Teachers will access the materials from the ENGAGE national portals (i.e. Knowledge Hub). Based on the DoW, the following criteria informed the design of the materials for this stage:

- Scenarios: start by engaging students in a realistic scenario. For instance, animal testing for science.
- Learner ideas: usually, learners tend to consider only their own ideas. Instead, ADAPT materials will make students defend, for example, ideas from others.
- Longer and more flexible: they enable deeper practice of inquiry than topicals (from ADOPT) since they last for about 2 lessons and they are structured around a big idea. They enable teaching complete topics, whereas topicals from ADOPT enable to apply an already taught idea. They afford greater flexibility while providing a lot of guidance to the teacher and minimise preparation time.
- Templates: at an internal level, templates will enable releasing materials shortly after the news story constituting the context of the material comes out.
- A game should be used as a learning activity to explicitly teach RRI skills
- Each material will tackle one of the 8 RRI skills as stated in the ENGAGE RRI curriculum

Up to date, 10 ADAPT lessons have been published as 5 downloadable materials. It is planned to publish 20 lessons as 10 sets of Materials. Below is a short description of materials published until now.

Animal testing

1.2 million EU citizens have signed a petition for the complete ban of animal testing. Their argument being it is both unethical and not useful. In this activity students are asked to decide whether they agree. They apply their knowledge about how asthma affects the gas exchange system to examine evidence and decide if animal testing is essential to developing new asthma drugs. They also learn about how to use ethical thinking to make difficult decisions and study different ethical viewpoints.

Electronic cigarettes

Turkey, Wales, Normandy and parts of Canada have recently banned the use of electronic cigarettes indoors, and the EU is considering following their example. Campaigners in support of an EU-wide ban point out that nicotine from e-cigarettes may contribute to heart disease and cancers, as well as damaging the brains of developing foetuses. In this activity students decide whether they support a ban. They apply their knowledge of particle theory to decide whether exhaled nicotine can reach non-vapers nearby, and then learn to judge risks to decide whether the benefits of a ban on indoor vaping outweigh the risks.

2 degrees?

December 2015 was the wettest month in the UK since records began and devastating floods affected thousands of people. Scientists believe climate change may have caused this extreme weather. In this sequence students apply their knowledge to create an apocalyptic weather report. Then they learn the skill of examining consequences, and judge solutions for limiting the temperature rise to 2 degrees.

Man or machine?

Sports records are continually being broken – balls hit harder, javelins thrown further and bicycles travelling faster – but are these improvements down to the athlete or the engineering? In this activity students apply their knowledge of frictional forces to design a racing bicycle to help team GB smash more records on the cycling track in the 2016 Olympic Games. After a ruling body claims their design gives an unfair advantage they will learn how to critique evidence in order to decide if they agree with the decision.

To frack or not?

The extraction of gas from shale rock – hydraulic fracturing, or fracking – is widespread in the USA. Whilst some countries in Europe have banned fracking following concerns that substances used in the process pollute water, others want to exploit shale gas reserves to provide new – and cheap – sources of natural gas. In this activity, students decide whether they support a ban on fracking. They apply their knowledge of the properties of rocks to decide whether substances from fracking can get into water, and learn how to justify opinions.

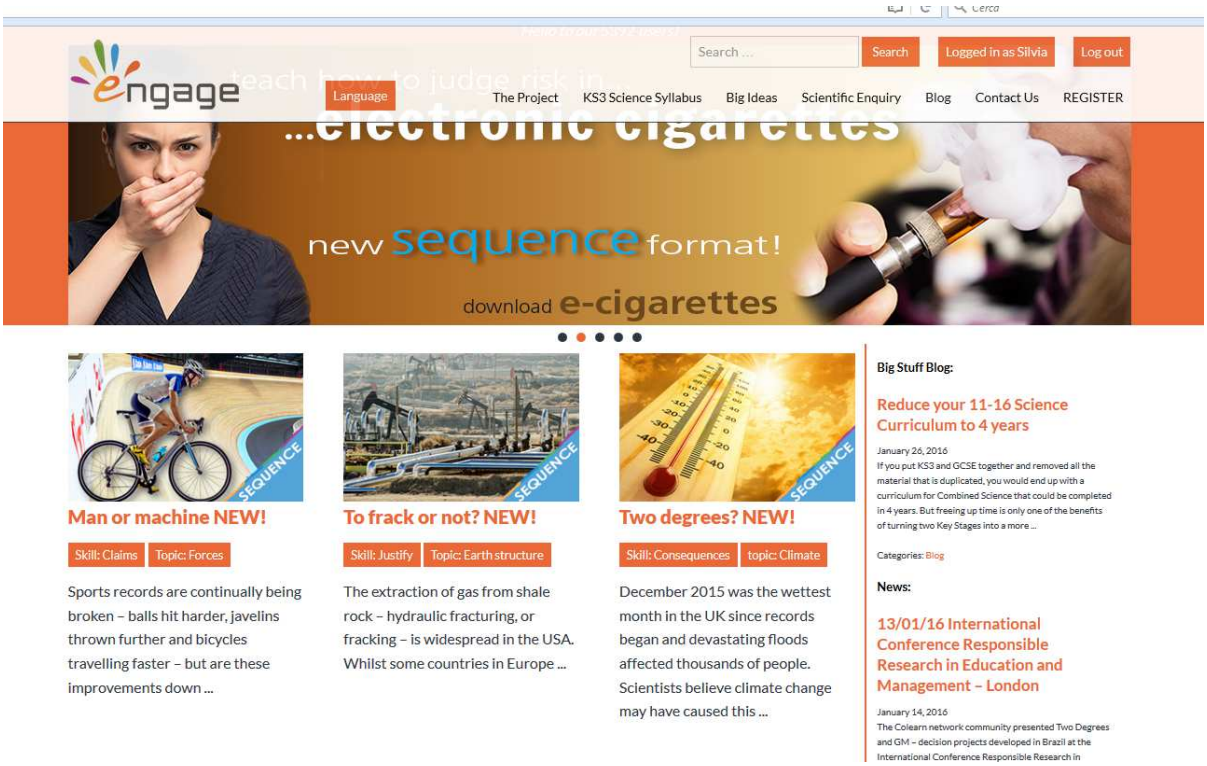


Figure 2: ADAPT materials at the ENGAGE Knowledge Hub

Updates in the Knowledge Hub

ADAPT materials are hosted at partners' National Knowledge Hubs. A number of developments on the Knowledge Hub have taken place in order to support the ADAPT stage of teacher CPD, namely self-promotion system, pop-up window, and user profile for ADAPT users.

Self-promotion system

At a consortium level, it was necessary to distinguish between teachers who follow the ADOPT and the ADAPT stages of the ENGAGE CPD. This would enable to keep track of partners' progress towards the quantitative targets and to target the dissemination and networking activities as two separate groups, considering that they have different competency about RRI for science teaching. ADAPT teachers are considered as advanced users, which most of them already went through the ADOPT stage. For this reason, the following criteria were established to become an ADAPT teacher:

- Register at http://www.engagingscience.eu
- Fill in a form with 2 items:
    - How many ENGAGE materials have you used? (1, 2, 3 or more)
    - Please state the purpose for which the ENGAGE materials are more suitable:
        - Applying science content
        - Developing student inquiry skills
        - Increase students' interest towards science

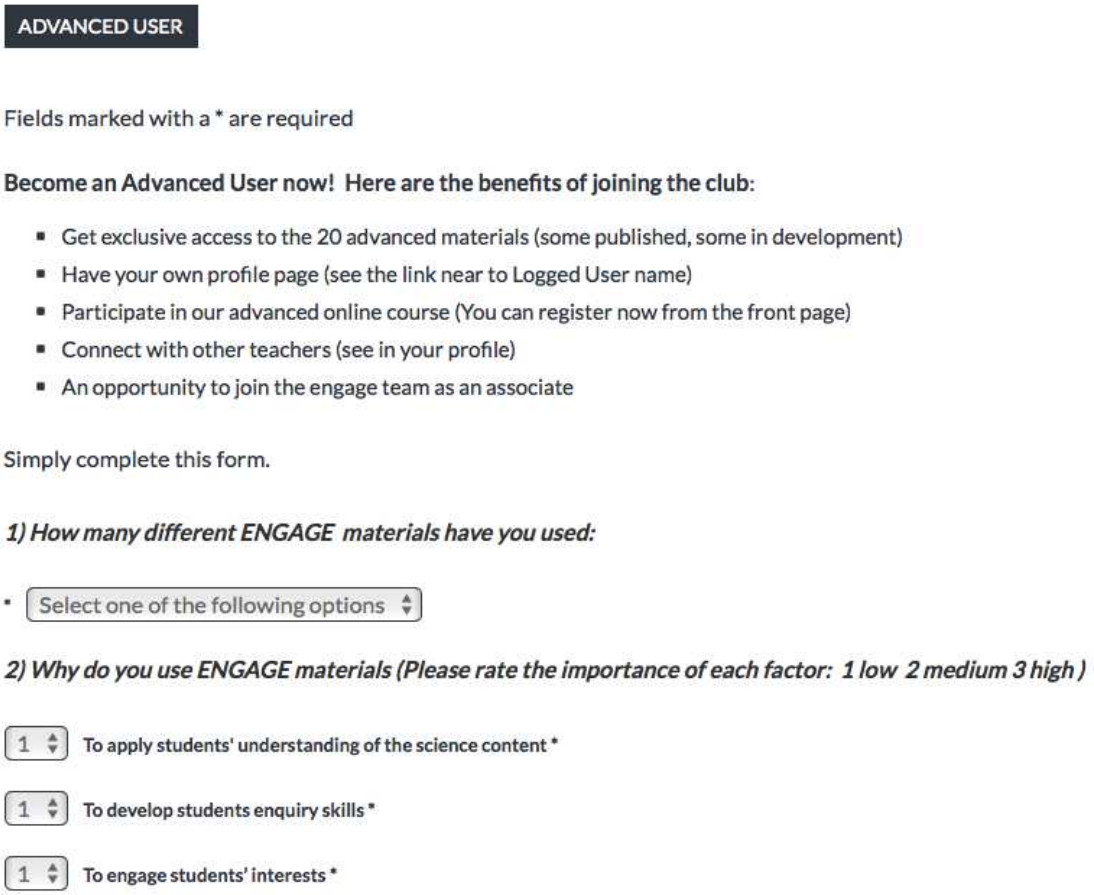


Figure 3: Form to become an ADAPT user at the ENGAGE Knowledge Hub

After filling in the form, users get promoted to ADAPT automatically. In this way, ADAPT is open to any teacher who feels ready to teach RRI skills to their students at an advanced level. However, the data collected in this form is useful to understand how many of these users have already completed the ADOPT stage of ENGAGE. It is worth noting that one of the goals of the project is to guide teachers in a progressive use of RRI teaching, as represented by the 3 stages of the ENGAGE CPD, namely ADOPT, ADAPT and TRANSFORM.

Welcome message

A welcome message appears after logging in. It includes information on the number of materials downloaded by this user and the number of reviews. The last downloaded material is also highlighted, with a link to it, and a message encouraging to publish a comment about it (see image below). This message is aimed at increasing the number of downloads and material reviews, and the eventual application in the classroom.

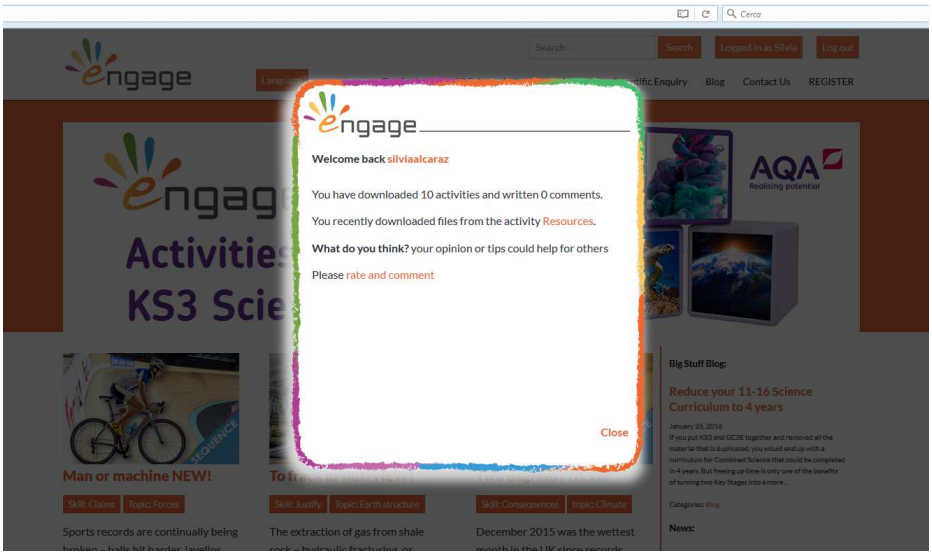


Figure 4: Pop-up window at the ADAPT version of the Knowledge Hub

Likes

A "like" button has been implemented on the Knowledge Hub, so that teachers can easily express their support to an ENGAGE material. The "like" button has also been implemented for the comments section of each material.

Number of users

As a strategy to encourage teachers to register for ENGAGE, a welcome message was included in the homepage. The message showed the number of registered users.

Ratings

A rating system has been established for teachers to provide feedback on the affordances of the materials in a very easy and quick way. Feedback is divided in 3 scales, namely “Application of scientific knowledge”, “Increasing students’ interest towards science” and “Development of inquiry skills”. In order to encourage teachers to download materials, a counter was added next to the material, which states the number of downloads (see figure below).

User profile for ADAPT users

The profile presents a summary of registered personal information: name, email, picture, school, as well as the content of material comments. It also includes the link to the expert profile in brokering system (http://www.engagingscience.eu/en/brokering/), statistics about the personal usage of the site (number and title of materials downloaded, number of comments and likes to materials), links to used lessons, skills, topics, comments.

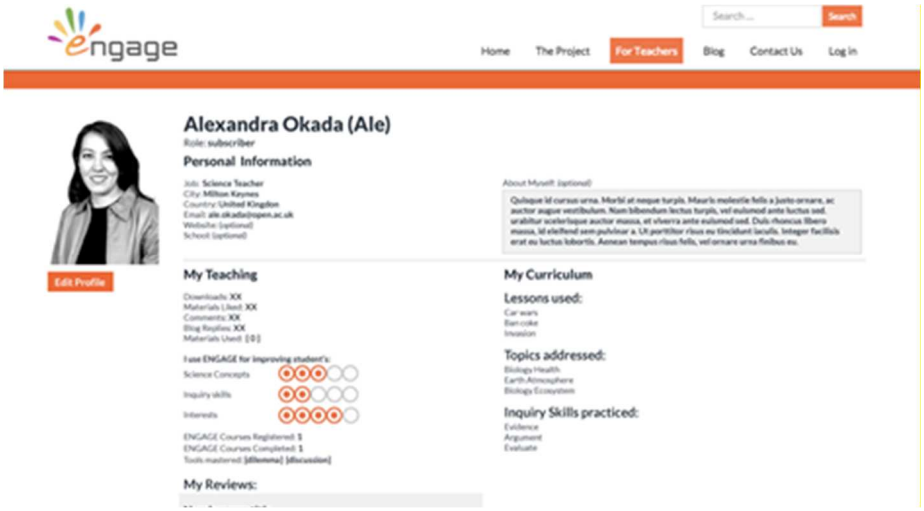


Figure 5: Profile page for ADAPT users (prototype)

Ensuring relevance of materials to interests of local teachers

UB has coordinated several actions with the goal to ensure that the ADAPT materials were relevant for local teachers. First, during the face-to-face meeting in Milton Keynes (July 2015), it was agreed that:

- Each material would tackle one of the 8 RRI skills as stated in the ENGAGE curriculum, namely: interrogate sources, use ethics, examine consequences, estimate risks, analyse patterns, critique claims, justify opinions, and communicate ideas.
- Each material would relate to a different field of science: biology, geology, chemistry, and physics.
- Teachers can rate the extent to which they find materials useful on 3 scales: science content, inquiry skills and student motivation.

A brainstorming session took place, in which representatives from partners suggested topics that could engage students in their countries. The topics were linked to the curriculum and the RRI skills, as stated above.

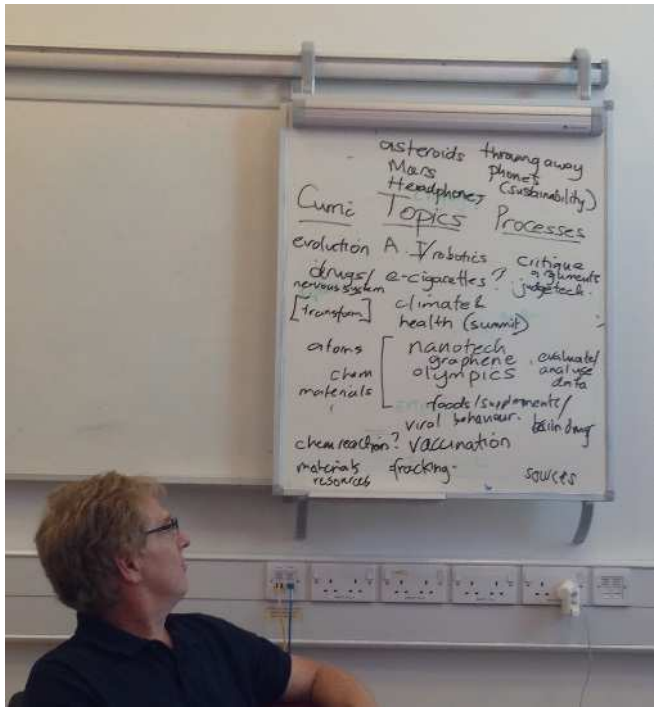


Image 1: Brainstorming on ADAPT materials at face-to-face meeting (July 2015)

Moreover, the ADAPT materials "Animal testing" and "E-cigarettes" were considered as pilot. Before publishing them on the Knowledge Hub, these materials were tested for feedback in selected partner countries, namely Cyprus, Switzerland, and Spain. The testing took place between November and December, 2015. Results are presented below.

Animal testing

The "Animal Testing" material was disseminated in **Cyprus** from November 2nd until November 25th, 2015. The material was placed in Dropbox and the teachers were provided with the link. We asked the teachers to email any comments they had about the materials. The following ways were used for the dissemination of the material:

- It was presented in 2 face to face workshops and meetings with teachers. 35 teachers were reached this way.
- An email with the link to the material was sent out to a list of science teachers. 106 teachers were reached this way.
- An announcement was placed on Facebook with the link to the material.

We received a total of 23 emails with comments on the Animal Testing material, mostly from teachers that attended our face-to-face meeting. Overall the comments were positive, and these are summarized below:

- The teachers appreciated the way that the evidence was used in lesson 1. However, most of them would prefer if students collected the evidence themselves.

- According to one teacher, the topic is close to students' lives since most of them have animals as pets.
- All teachers positively comment on the fact that the students use ethics in their decision-making.
- Some teachers suggest that it would be better if the three types of ethics came out from the students during the discussion and were not provided by the teacher.
- Some teachers stated that the TV game was out of context and did not match with the rest of the lesson.
- Some teachers commented that the lesson is not appropriate for younger students, and topics like circulation should be covered before teaching this.
- One of the teachers believes that the theories on ethics are complicated and more information is needed for the teachers to understand.

Below we provide translated parts of the comments from three teachers:

"I like the fact that they have used scientific evidence and ethics in this lesson. In this way the students can express their opinion but at the same time they can read the and understand the evidence. I would prefer to see the students doing more – they could collect evidence on positive and negative from animal testing and have a debate. I also like the fact that they are using ethics and they need to justify which type of ethics they are using. I did not like the activity with the TV game. Maybe the goal is to learn about ethics, but it is out of context and directs the students elsewhere» (Alexandra)

"I like the fact that they are using ethics to argue in this lesson, but the theories that are provided are complicated, and more information on these theories is needed for the teachers and the student» (Kristia).

"I like that they are using this specific problem of asthma to present the issue of animal testing. Maybe more information about drugs related to asthma, and animal testing related to asthma drugs would make more sense. I would not include the tv game activity in my teaching as this is irrelevant to the previous information presented to the students. Other than that there are a number great ideas on organizing an argumentation lesson in the animal testing materials» (Anna)

E-cigarettes

A lecture with the material e-cigarettes took place at PH (Switzerland). The following aspects were pointed out as improvement suggestions:

- Many skills of the pupils are provided where you - if they did not - very work needs to get to the level. So, for example, the way to find a scientific method behind a situation -> work in classes for weeks
- Without further research too little information is available to explain the e-cigarette detail

What participants like:

- Connection to the curriculum: very convenient because you have a concrete idea of what you're working with the children
- Integration of different forms of work: teamwork, cooperative work between the students.
- Detailed description and concrete assistance for the implementation of the hour; especially with the numbers of the PowerPoint slides within the text
- Hints about the desired behaviour in the teacher: that he should be encouraging, questions he could ask / should
- Learning objectives and purposes described very clearly and in detail

Global opinion by participants:

- Student sheets are very detailed and helpful, the behaviour of the teacher is clear
- The possibility of two lessons on a topic is very interesting if the second is building on the previous
- We would use the material, but do not plan our lessons based on the topics available or depend on them
- As awareness of the benefits of tobacco and its harmful consequences would be more effective with normal cigarettes: teenagers are in our opinion still more with the "smelly" cigarettes in contact as the odor-neutral or good-smelling E-cigarettes.

In **Spain**, the material was sent by email to an expert teacher, who had applied ADOPT materials and who is knowledgeable about teaching socio-scientific issues. Considering that the activity is rather long, he stated it is good if divided into two sessions. It puts in practice concepts (concentration, distribution, particle-material SS1 -...) and skills (graphic representation -Slide 14, 2- module) which are somewhat complex. The value as evidence of the references on slide 5 could be more explicit, because they come from scientific journals.

The activity uses the statistical concept of Hope (the probability of something happening by the value of its consequence), but does not use it as a word, and perhaps it should at least be mentioned in the materials for students.

The comparison of transport safety (Slide 9 Module 2) is somewhat tricky by using kilometers. Other variables (travel time, number of users, number of accidents, who has control of driving) could lead to different results. This deserves at least a mention in the teacher guide.

Online courses for conceptual input

As opposed to ADOPT, partners are not requested to organise face-to-face workshops for ADAPT. The ENGAGE programme is delivered exclusively by means of on-line courses, although if partners consider it useful, they are encouraged to organise or participate in face-to-face demonstrations of materials or other face-to-face events such as teacher fairs (see Appendix 3 for the full list of ADAPT dissemination events by country).

The goal of the online course was to provide teachers with conceptual input on the pedagogical strategies recommended for RRI teaching by:

- Explaining teachers in a detailed way the pedagogical benefits and groundings of the learning activities present in the ADAPT materials, and checking their understanding
- Promoting the inclusion of the ADAPT materials in their teaching practice with the support of expert RRI teachers
- Fostering reflection and exchange of tips and advice related to explicitly teaching RRI skills to their students with the ADAPT pedagogical tools

Five partners led by the Open University (OU) have developed the content of the online course for ADAPT. The online courses focus on the toolkit that will enable teachers to teach science content in an RRI way. The tools are:

- RRI *Problem-solving lesson tool*:
  - Processes and skills
  - Thinking guides
- RRI *Conversation tool*:
  - Teach an argumentation framework - to scaffold students towards competence
  - Develop student communication skills - how to facilitate a well-ordered discussion
  - Model an open stance - how to handle controversy

Assisting partners in online course configuration

The content of the online course was defined in the course book, which was released as part of WP3. It was shared with all ADAPT partners, who were in charge of translating and localising the content. Partners communicated individually with WP2 leader to set up the online environment of the online course, as well as to add content, learning activities and assessment. The following steps were provided by WP2 leader:

1) Log in at http://studio.engage.exactls.com/

If you don't have a user, contact Elisabetta Parodi at parodi@lattanziogroup.eu or e.parodi@exactls.com and give her an email address different form the one you use in engagingscience.eu and engage.exactls.com

2) Export the original course A

Enter in studio: Tools/ Export click on Export (--> package A).

Note: you need to be an administrator of the original course in order to export it. Ask Alexandra or Elisabetta.

3) Prepare studio for the new course:

Create an empty new course B with the right info (course name, Organization, Course Number, Course Run)

Note: you need to have course creator privileges in order to create courses. Ask via email to Elisabetta telling the email you use to login to studio

4) Import

Open studio, open course B

Tools/Import the package A

UB coordinated this process and provided guidance to partners on how to set up their online courses. UB was the first partner to deliver the 1st ADAPT online course.

Community

The main goal of the community activity in the ADAPT stage is to stimulate teachers who have used the materials from this phase to reflect on why and how they work. Teachers can also ask questions or engage in discussions about different aspects of the materials. These forums are facilitated by expert teachers, and the aim is to support novice teachers by answering their questions and/or concerns and build their confidence. In order to make this possible, UB has created and shared with partners a set of guidelines for seeding and managing an online community of practice. The guidelines aim to be a tool for mentors to promote exchange with teachers and between teachers themselves, and they are available in Appendix 2.

2. 1ST YEAR OF ADAPT: COORDINATION AND MONITORING

In this section we report on the implementation of D5.1 ADAPT Dissemination and networking plan. The reporting period covers from October 2015 to April 2016, i.e. 7 months. We contextualise the work done in ADAPT, we explain in detail the coordination and monitoring system that was established, and we report on two main milestones in which analysis of partners' progress has been performed and, when needed, action plans provided.

2.1. Interdependencies

In order to understand the developments in ADAPT, it is worth noting the interdependencies with other ENGAGE Work Packages. It is expected that a number of ADOPT teachers move to ADAPT, thus achieving a greater commitment to including RRI in their teaching. This means that ADAPT (WP5) is highly dependent on the developments in ADOPT (WP4). Moreover, technical developments (WP2) are needed in order to deliver ADAPT materials, courses and community. Finally, the ADAPT materials and the content for the online course were developed by WP3 (see table on next page).

According to the original plan, D5.10 was due in M24, i.e. December 2015. Our goal was to report on the results of implementing the ADAPT phase of the ENGAGE programme in partner countries. The delays in WP2 and WP3 led partners to start delivering actual ADAPT activities (mostly materials) in October 2015. This means that by December 2015, there was not enough data available so to provide a comprehensive picture of the first cycle of ADAPT dissemination and implementation in terms of the 3 strategies of the ENGAGE programme. For this reason, we proposed an extension of 5 months, i.e. until 31st of May 2016.

Activity with ADOPT WP5	Minimum requirements for implementation – WP5	Completion date
Materials	ADAPT materials development – WP3	On-time as in schedule (no materials published in January 2016)
	Knowledge Hub updates (self-promotion system, number of downloads) – WP2	October 2015
On-line courses	Development of the ADAPT CPD tools (problem-solving & conversation), On-line course content – WP3	End of September 2015
	Updating the on-line course learning environment (EDX platform) –WP2	February 2016
Community	Recruit and train mentors – WP5 (VUT)	February 2016
	Knowledge Hub updates (welcome message, likes, user profile, ratings) – WP2	March 2016

2.2. Coordination and monitoring system

A key element for coordination and monitoring was the monthly monitoring forms, which were developed online by UB (available at https://docs.google.com/forms/d/1RQnvuPGzQMF3ByQeLlNlk1q2ecSVAWEMGjwOC1Z52hE/viewform). Such form enabled partners to provide feedback on their progress in terms of the 3 strategies of ENGAGE, i.e. materials, courses and community. UB provided feedback to partners on their monthly monitoring forms.

Between September 2015 and February 2016, the average response rate to the form was 7 out of 11 partners. In order to encourage partners to fill in the form, in March 2016 it was reviewed and simplified by UB. The new form is available at https://docs.google.com/forms/d/1YAtM5HSqnXAChlT_DlB_i7wXuksERvV-xZ-KLvixn44/viewform

The online collaboration tool ASANA was promoted by UB to ensure partners' progression to the ADAPT targets. More specifically, UB set up a project for each country implementing ADAPT. The project included tasks related to ADAPT dissemination and networking, such as publishing new ADAPT materials and disseminating the online course. Besides, a monthly task was set up to fill in the monthly monitoring form. All tasks included title, task description, assignee, and due date (see screenshot on next page).

Figure 6: Using ASANA for task completion in ADAPT (example for Spain)

The ASANA tool "team conversations" was also used to communicate messages to all ADAPT partners (see screenshot below). The main topics for communication have been:

- Technical developments to support the ADAPT stage of ENGAGE CPD
- Reminders about new ADAPT materials for translation and publication
- Requests for filling in monthly monitoring form
- Sharing feedback on partners' progress towards ADAPT targets
- Providing guidelines to foster National Communities of Practice

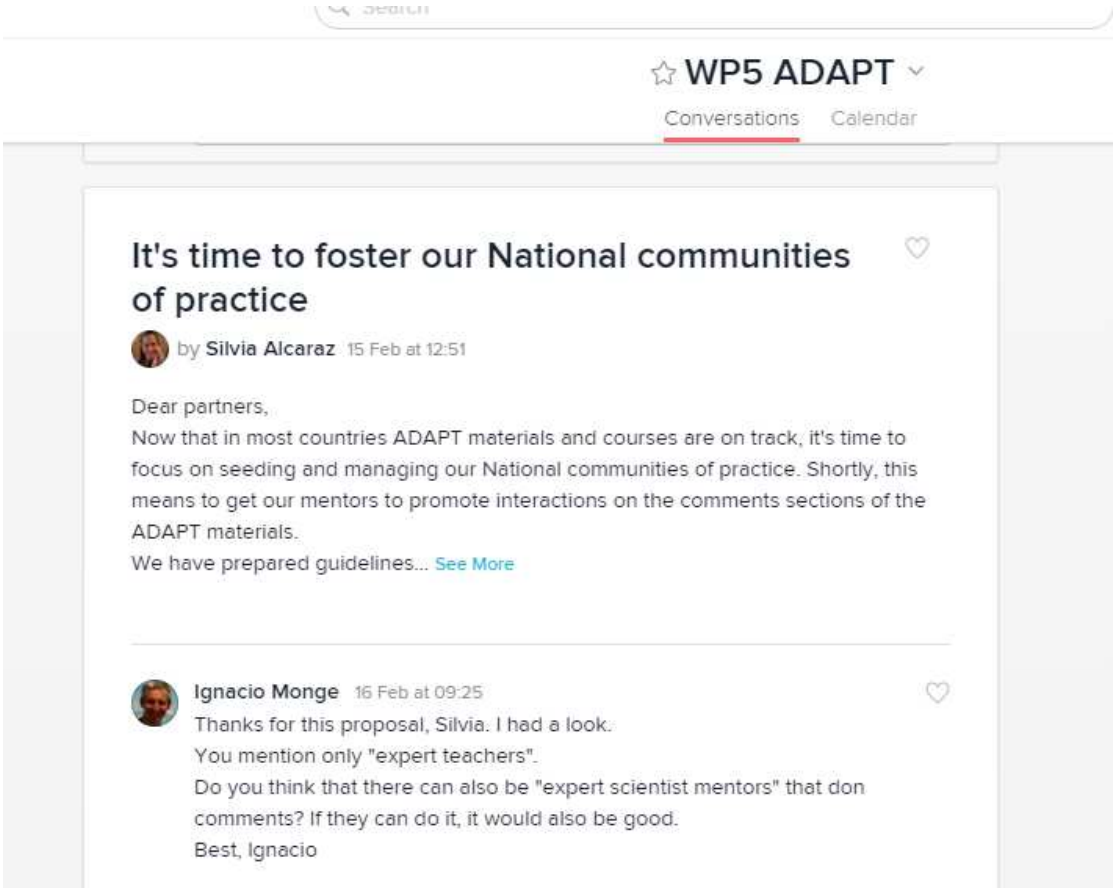


Figure 7: Using ASANA for communication with ADAPT partners

2.3.Monitoring progress: first round

During the first three months of ADAPT, the priority was to encourage teachers to become advanced users on the Knowledge Hub, so to download ADAPT materials. In January 2016, UB led a process to understand, collect, summarise and share the progress from each partner towards the quantitative goals focussing on the number of registered users as well as the number of downloads. Results are presented as follows.

ADAPT registered users

Partners reported on the number of users on their National sites by means of the monthly monitoring form. By that time, it was considered as good progress to meet 50% of the target for ADAPT 1st year, due to the fact that there were still some months left.

As it can be seen on the table on next page, 7 out of 11 partners were making good progress towards the target. More specifically, Lithuania overcome the target, and 6 out of 11 partners achieved between 45% and 65% of the target. From those, UB asked partners whose number of users was under 50% of the target to explain how they would strengthen their dissemination strategy.

Country	TARGET	Number at 31/12/2015	Achieve-ment	Comments by UB
UK	300	150	50%	You have achieved half of the users needed. We recommend to keep on with your dissemination strategy
Greece	60	0	0%	This number is way below the target. Please reconsider the effectiveness of your dissemination strategy and provide action plan
Germany	400	17	4%	This number is far from the target. Please reconsider the effectiveness of your dissemination strategy and provide action plan
France	300	115	38%	You have achieved almost half of the users needed. We recommend to keep on with your dissemination strategy and strengthen it to keep and/or increase your growing pace, please state how
Romania	100	47	47%	You have achieved half of the users needed. We recommend to keep on with your dissemination strategy, please state how
Israel	40	18	45%	Number is a little below half of the target. Please indicate your plans to make this number grow
Spain	230	110	48%	Number is around half of the target
Norway	30	6	20%	This number is way below half of the target. Please reconsider the effectiveness of your dissemination strategy and provide action plan
Switzerland	20	13	65%	You have achieved half of the users needed. We recommend to keep on with your dissemination strategy, please state how
Lithuania	20	73	365%	No issues identified. Congratulations!
Cyprus	10	6	60%	You have achieved half of the users needed. We recommend to keep on with your dissemination strategy, please state how

The four underachieving partners received a warning comment asking them to reconsider the effectiveness of their dissemination strategies and provide an action plan, which are presented below.

Greece: We have been in contact with ASPAITE in Patras (in-service teacher training institute) and have arranged a 2 days event on ENGAGE with the responsible people there (arranged for 23-24 of March). 120 teachers will participate in hands on-workshops. We have arranged 4 workshops with 30 participants/workshop (sessions of the workshops: ADOPT materials presentation and training on ADOPT tools; ADAPT materials hands on-session and commenting). In the meantime we will continue massive emailing, and contacting other teacher training organizations (we see potential of F2F events in teacher

training organizations, as massive emails do not seem to work here – although we have used both an engage email and our personal emails – as people are more keen to open and respond to an email from FORTH, it is more recognizable than an email from engage project). As in the 2 days' workshop we will have hands on-activities in the platform we expect in terms of ADAPT: Having the participants registered as advanced users and provide initial comments on the materials; Recruit more participants for the on-line course.

Germany: Teachers like the materials but they do not use them as they are – they use them as a starting point - because the science in the materials is not enough, not accurate enough, and above all they want to do their own thing. They don't take a "material out of the shelf" and simply use it. Downloads are very good for adopt. Downloads are bad for adapt. Teachers don't like the teaching sequences. They explain that they hardly are able to get one teaching hour to do different things, and impossible to do two hours.

France: Having an ADAPT material on the COP21 was really helping for French teachers. 2 degrees is the most downloaded ADAPT material. The fracking material can also be very interesting for French teacher.

Israel: This is because it took Elisabetta some time to update our website for ADAPT, and meanwhile teachers downloaded the ADAPT materials without being registered as ADAPT teachers (see the no. of downloads!). I counted only after the little questionnaire was set up. Anyway, we will do our best to meet the target.

Spain: Emphasize communication with ADOPT users to encourage them to self-promote themselves to ADAPT

Norway: The main science site for science teachers in Norway has presented information and links to all the materials that were published before the summer, and a lot of our visitors come from this place. Now we have refreshed their information, so that this also includes the last ADOPT materials and the ADAPT materials. This (combined with my heavy contacting of science teachers for the PCK impact research project) has led to a spike in the ADOPT material download, but NO increased registration of adapters or download of the ADAPT materials… Elisabetta found some mistakes in our website, and fixed is, so hopefully things will be better soon. But still – the first step is to get more adapters…

Switzerland: Dissemination through planned workshops, online course in April, newsletter and research project.

Numbers shown in table above are the result of three months of effort by partners to disseminate the ADAPT materials, and to motivate teachers to propel from ADOPT to ADAPT. Nevertheless, the responses to the monthly monitoring form enabled UB to understand the progress towards these numbers. As a general trend, we can see that the number of users has increased progressively in all ADAPT countries (see figure below).

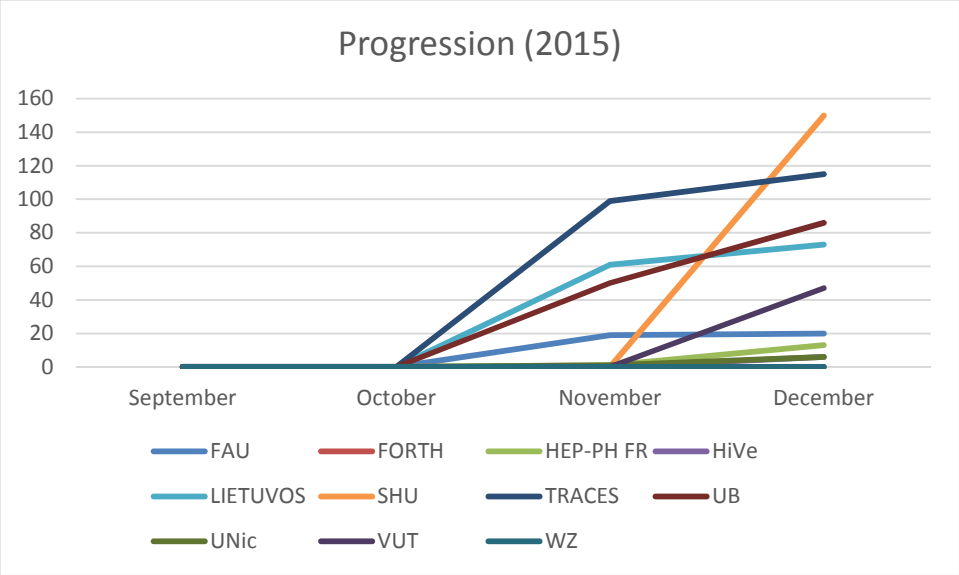


Figure 8: Progression on number of ADAPT users by partner

ADAPT material downloads

The number of downloads was also monitored on the first round. Table below shows number of ADAPT materials downloaded by 31/12/2016. These numbers refer to the material "Animal testing", "e-cigarettes" and "2 degrees", which were those available on the Knowledge Hub at that time.

Country / Material	TOTAL
UK	0
Greece	0
Germany	110
France	392
Romania	257
Israel	0
Spain	343
Norway	5
Switzerland	39
Lithuania	263
Cyprus	150

Table 1: Number of downloads in January 2016

Numbers show that in 8 out of 11 countries teachers were downloading the ADAPT materials. Partners who were underachieving in the number of downloads were the same as those who didn't have any ADAPT users on the Knowledge Hub (see subsection above). In the same way as for the number of users, when looking at

the progression of the number of downloads, we can see that all countries made good progress (see figure below).

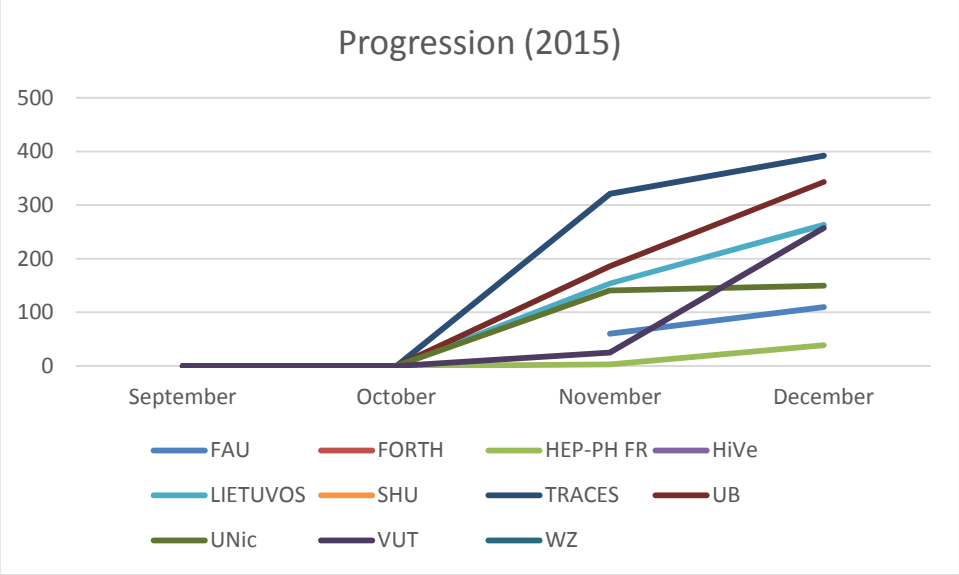


Figure 9: Progression of the total number of ADAPT material downloads by partner

UB collected the challenges stated by partners at the monthly monitoring forms regarding materials, courses and community and it has provided solutions and shared them with partners, which are shown in Appendix 1.

2.4.Monitoring progress: second round

In March 2016, a second review of the ADAPT dissemination strategy took place. This time the goal was to promote partners' exchange about challenges, as well as possible strategies to overcome them.

Challenge 1: meeting the targets for ADAPT users

One of the goals of ADAPT is that 25% of teachers in ADOPT progress to ADAPT. However, it was detected that the majority of partners were having difficulties to meet this requirement. The following strategies were shared by partners as useful:

- Offer open ADAPT materials for a limited time, such as two weeks
- Offer a preview of the powerpoint without registration (as in UK website)
- Identify teachers who have registered to the site but never downloaded anything, or they downloaded something a long time ago. Then send them personalised emails to remind them.
- Massive mailing campaigns to junior and high schools (France)
- Develop the blog and make the website more friendly (for example see French page what is an Engage resource: http://www.engagingscience.eu/fr/2015/11/13/quest-ce-quune-ressource-engage/) (France)

- Boost social media, especially twitter (France)

Challenge 2: Getting feedback from teachers on ADAPT materials

In most countries the number of ADAPT users and material downloads was growing, but it was difficult to understand whether teachers were using them and what kind of strengths and weaknesses they could have. To that goal, the following strategies were defined:

- Check material likes and ratings in Administrator panel of Wordpress
- Check download statistics in Admin panel of Wordpress
- Put an explanation about "Sequences" (i.e. 2 lesson long materials) and why we are doing it (see UK site)
- Write an email to ADAPT teachers with 2 short questions asking for feedback

Challenge 3: Improving monitoring strategy

In order to optimise the process for WP leaders to get feedback on partners' progress towards the targets, the following monthly review system was designed by the coordinating team, which was exposed at an online meeting and agreed by all the participants:

1. Enter data on key indicators monthly (end of month)
Use a single spreadsheet which partners fill in directly, monthly. It only has the key indicators.
https://docs.google.com/spreadsheets/d/1SrtiPf6hFO0LEskWgy_73BbLiqZzpBHlI585D5fmOFI/edit#gid=684478235

2. Partners review progress and make new plans
Each partner decides if they have made OK progress towards targets on each indicator. If not they describe what action they will take on the Monthly Progress project in ASANA:
New! Monthly progress project OTHERS TO ADD:

3. WP leaders review progress against targets (beginning of month)
Adopt, Adapt and Transform WP leaders review the reports from partners, comment, and share successful strategies.
Streamline data collection Partners put key numbers in dashboard spreadsheet.
WP4 + WP5 leaders review progress against targets and present in 1st meeting of the month, with ALL partners present. Partners explain what they are doing to improve numbers

4. Progress is reviewed by the Steering Board in the Weekly meeting (beginning of month)
The main item of the first meeting every month is for WP Leaders to summarise the progress, problems and actions.
The Steering Board members will comment.

3. ADAPT 1st YEAR DISSEMINATION RESULTS

As shown in previous sections, ADAPT monitoring has enabled to understand the progress towards the goals, as well as to take actions to share successful dissemination strategies as well as possible corrective actions. The present section aims to show an overview of the dissemination strategies used, as well as the results of such actions in terms of the latest results.

Partners have used a wide range of dissemination activities, including posts in teacher associations, networks, training organisations and governmental institutions (see Appendix 3 – National ADAPT dissemination reports). Direct email marketing to registered users at the National Knowledge Hubs has played an important role in motivating ADOPT users to propel to ADAPT.

Figure 10: ADAPT email marketing campaign (France)

3.1.Materials uptake

Localisation of materials

A key element for promoting material uptake in ENGAGE is that they address topics which are close to students' lives, and that include the right elements for teachers to include them in their practice easily. For this reason, even if ADAPT materials are developed at a consortium level, the diversity of countries was taken into account. Two versions of the ADAPT material "2 degrees" were released by WP3 leaders, namely

one for countries with temperate climate and one for other countries. Similarly, two versions of the "To frack or not?" ADAPT material were made available to partners, namely one for countries with a ban on fracking and countries without it.

ADAPT material dissemination results

By looking at the number of users registered at the National Knowledge Hubs, we can state that the ADAPT dissemination activities have succeeded in motivating teachers to join the ADAPT stage of ENGAGE. A total of 1324 teachers across Europe are now advanced users on the National Knowledge Hubs, as shown in table below. This represents an 88% achievement of the target established until July 2016.

Country	TARGET (by July 2016)	Number at 03/05/2015	Achievement (%)
UK	300	656	219%
Greece	60	23	38,3%
Germany	400	26	6,5%
France	300	135	45%
Romania	100	73	73%
Israel	40	34	85%
Spain	230	241	105%
Norway	30	15	50%
Switzerland	20	29	145%
Lithuania	20	82	410%
Cyprus	10	10	100%
TOTAL	**1510**	**1324**	**88%**

Table 2: Number of ADAPT material downloads by country

Teacher feedback

According to the teacher inquiry model of ENGAGE (see section 1), it is crucial that teachers use the materials in the classroom. This means that it is very important to understand to which extent the materials meet teachers' needs, which pedagogical strategies foster and what are teachers' impressions about students learning. Gathering feedback is crucial in the ADAPT stage of ENGAGE because the better materials address teachers' needs, the more likely it will be that they follow the progressive staircase of involvement: ADOPT- ADAPT – TRANSFORM.

For this reason, UB has coordinated the collection and selection of positive comments and improvement suggestions for each of the ADAPT materials which are currently published on National Knowledge Hubs. Below we provide a selection of relevant comments, translated into English when necessary.

Animal testing

Among the **positive comments** which teachers have published about this material, we highlight those which emphasize the student skills that they address, and how teachers embed these activities in their teaching:

These are really fabulous materials, so much better than anything else I have found in my extensive searches for resources on the internet. They really get to the heart of developing pupils understanding. I like them because they engage the pupils with something relevant to their own lives and yet the contexts aren't trivial, they actually use science to solve problems in a real life situation which means the pupils see the point. Risk is such a difficult topic to explain and get pupils to understand without making them totally bored and switching off and by making a game out of it, they really get it. Thanks!! (United Kingdom)

My school work by centres of interest. Therefore, the choice of material Engage is conditioned by the projects we are carrying out. In third ESO we conducted a project on "the human body, the perfect machine. One of the planned activities traditionally refers to the capabilities of the brain and it is part of a series of videos in which some experiments with chimpanzees are observed. Students usually enjoy this activity, but they had never suggested any ethical concerns about animal experimentation So, I chose the activity "animal testing" to use it immediately after the activity of chimpanzees, for youth will confront the two activities and see how well you could enrich the discussion. (Spain)

The material used in lesson may lead to the development of scientific thinking: the risk assessment both in practical science and in the wider social context, including the perception of risk in relation to data and its consequences. (Romania)

The material is particularly interesting as it brings students face to face with a serious moral dilemma. Students are asked to use scientific evidence of how asthma affects gas exchange during respiration and examine evidence to determine whether animal testing is necessary for drug development. Students are invited to use moral thinking to decide whether animal testing is right or wrong" (Greece)

I used this lesson (animal testing) with my students. I thought that more information about drugs related to asthma, and animal testing related to asthma drugs would make more sense so I asked my students to use the computers in the classroom to search for more information. I did not include the TV game activity in my teaching but instead we talked about the different ethical and moral aspects of the problem during our discussions. (Cyprus)

Among the comments providing **improvement suggestions**, the following has been selected:

We believe (a student group for primary education), the proposed tools are very complete and fun. They make you want to be played. However, the choice of the problem of asthma seems a little "light", in the sense that a more serious problem could question more strongly the ethics of research on animals. One of us met a researcher who worked on a product for restoring spinal cord after an accident. After several years of research on animals that have proven successful, they continue today on the man. In our opinion, this case is far more agonizing and gives another dimension to the problem. Overall, we find the very interesting didactic

means, well built, but we fear that the debate be distorted by too common aspect of the choice of the pathology. (Switzerland)

E-cigarettes

A number of **positive comments** on this material focus on the interest that e-cigarettes can raise in a class of teenagers, as well as the RRI skills which they enable to foster:

Excellent equipment provided and links are related to current events and provide good arguments for the debate. (France)

I prepare this lesson for the 11th grade students. The material presented already helped to prepare for the lesson "Respiration system". It will be interesting. It is a pity there will be a shortage of time to present the whole material during a lesson (Lithuania)

These are really fabulous materials, so much better than anything else I have found in my extensive searches for resources on the internet. They really get to the heart of developing pupils understanding. I like them because they engage the pupils with something relevant to their own lives and yet the contexts aren't trivial, they actually use science to solve problems in a real life situation which means the pupils see the point. Risk is such a difficult topic to explain and get pupils to understand without making them totally bored and switching off and by making a game out of it, they really get it. Thanks!! (United Kingdom)

Below we show comments with **improvement suggestions**, which mainly affect the time needed to implement the material:

It is a very actual theme. It is suitable for 10th grade students. After the theoretical part and some independent inquiry work pupils could think about usage of this product. The material of a lesson is quite interesting. But think it needs not only one lesson to analyse. (Lithuania)

I applied the activity on electronic cigarettes in the classroom. I divided it into two sessions, one for each lesson. I value positively the overall experience but there were some issues. For example, I found that some students have a misconception of electronic cigarettes as they thought that they don't have nicotine. Some did not understand that the vapour exhaled could affect people around. Despite the incidents discussed, I think it is a good material to bring to class and helps work the arguments and decisions in controversial situations (Spain)

I have not found links relating to scientific sources. (France)

Two degrees

The following **positive comments** show that the material feels useful for teachers and for curriculum developers:

I have found this resource to be most useful. It is very engaging, and makes what could be a somewhat dry discussion particularly interesting and fun, as a game. It really starts pupils thinking about science in a wider

and ethical context, engages their interest, develops their inquiry skills and pushes them to apply the content they have learn to the questions being presented. Excellent resource. (United Kingdom)

You present very interesting and cutting edge science topics. As a supervisor of learning materials in math and science I find your materials interesting. Awni Gebara (Israel)

Nevertheless, teachers published **comments with improvements** as contributions to the material, such as the following:

I think this material could be enhanced by making students compare the effects on different countries, so that they discover "what happens in their towns and in other ones?" "what is being done about it?" and "what can we do?" It could be interesting that students 1) Register temperature changes in a time-lapse; 2) Exchange problems of their communities; 3) Inquiry on what happened in a given time-lapse; 4) Share it by written, oral or other means; 5) Reach both individual and group conclusions; 6) Take actions. (Spain)

Modifications to materials on the basis of teacher feedback

UB has monitored the process in which the materials design team (WP3) has made corrections to already published materials on the basis of teacher feedback. As an example, the following comment was published on the UK Knowledge Hub for the ADAPT material "Man or machine?":

Hi, the forces you show on the bicycle in slide number 7 are wrong. The friction force pushes the bicycle forward. The rolling friction acts to stop the bicycle but it applies a moment not a force in the way you have presented. Prof. Reuven *Segev, Mechanical Engineering, Ben-Gurion University* (United Kingdom)

In response, material developers have moved the 'thrust' arrow down on the diagram on slide 7 to show it is coming from the back wheel on the road. This is the only change that was decided to make, in order to keep the physics accessible to younger students. The new version was shared with partners, who published it at their National Knowledge Hubs.

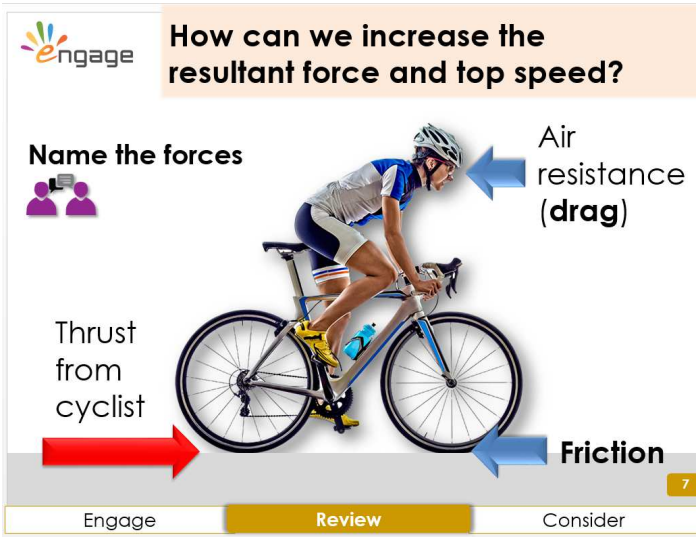


Figure 11: Powerpoint slide of the ADAPT material which was modified on the basis of teachers' feedback

3.2.Facilitating MOOCs

Localisation actions

Initially, the plan for ENGAGE was to deliver online courses separately for ADOPT and ADAPT. However, as it is explained in section "interdependencies", the development of ADOPT materials and online course content took longer than expected, and only a pilot course was delivered before summer break 2015. This has been reported in D4.2. Considering that most ADOPT online courses would be postponed until autumn 2015, which is the time in which ADAPT materials and online course content would be ready, most partners decided to run a combined ADOPT&ADAPT online course. Such courses included a first part of ADOPT CPD tools (i.e. dilemma and group discussion) and a second part focussing on ADAPT CPD tools, i.e. problem solving and conversation.

In order to maximise online course completion, partners were encouraged to localise the online course so to tailor it to the particular needs of the teachers. One of the main localisation actions was to change the platform in which to deliver the course. Partners such as Greece and France decided to use their own platforms, while keeping the content and learning activities.

ADAPT online course dissemination results

A total of 7 online courses have been delivered during the 1st year of ADAPT. UB monitored this process by helping partners to go through all the steps of course development and dissemination. As shown in table below, in four countries, namely the UK, Romania, Spain and Lithuania, the number of users who completed the online course is equal or greater than the target. Other countries, such as France, Switzerland and Cyprus have delivered their online course but the number of completions is far below the target. Norway could not achieve any completions on the first ADAPT MOOC.

Country	URL of course	Target	Completions	Achievement
UK	http://engage.exactls.com/courses/engage/uk00/2015a/about	25	25	100%
Greece	http://engage.exactls.com/courses/FORTH/GR001/Nov-Dec2015/about	15	0	0%
Germany	http://engage.exactls.com/courses/ILI-FAU/De01/1/about	25	0	0%
France	http://app.apolearn.com/classroom/836	25	1	4%
Romania	http://engage.exactls.com/courses/VUT/RO01/S1/about	20	44	220%
Israel	http://engage.exactls.com/courses/Weizmann/HE01/2016_T1/info	15	7	47%
Spain	http://engage.exactls.com/courses/UniversitatDeBarcelona/ES00/2015_T1/about	20	30	150%
Norway	http://engage.exactls.com/courses/Buskerud_and_Vestfold_University_College/NO00/2015_T2/about	15	0	0%
Switzerland	http://engage.exactls.com/courses/edufr/SW00/2015a/about	10	2	20%

Lithuania	http://engage.exactls.com/courses/LEU/LEU_kursas1/2015_T1/about	10	47	470%
Cyprus	http://engage.exactls.com/courses/unic/CY001/2015_T1/info	10	3	30%
TOTAL		**190**	**159**	**83,7%**

UB has asked partners to identify the reasons for their underperformance and in defining corrective actions, as shown below.

Switzerland: We realize that, in order to get registrations for the online course, it is not sufficient to announce it to the teachers that have registered in our site. We need to use the official sites. Our aim is to make publicity for the next online course in parallel to that for the workshops, through the official sites. In this way, teachers that cannot attend workshops (face-to-face) have the option of the online courses. The next online course is planned for the autumn (31.10.16 - 9.12.16; 6 weeks, as a combined ADOPT-ADAPT course).

France: The MOOC started with four teachers enrolled. Since it was an ADOPT + ADAPT combined course, dissemination actions for ADAPT were undertaken and enrolment deadline was extended while the ADOPT part of the course was running. However, no further users enrolled.

Cyprus: We have noted the problems that the teachers had and we will start a new MOOC end of February/early March with some changes.

In **Germany** it was not possible to facilitate any online course. According to the German partner, aspects like group discussion and conversation are not interesting for German teachers because this is a part of their university studies. In Germany you study to become a teacher on a certain subject and you get all didactics and pedagogical knowledge while you are studying and not afterwards. The only aspect, which is interesting is the aspect "Dilemma in Science Education". So we do have a problem that user needs to not go in-line with the project products. For these reasons, the German MOOC is in a current process of redesign.

3.3. Training expert RRI teachers for online Community of Practice

Developing the ENGAGE community of practice is one of the main targets of the project partnership. This community aims to help teachers to understand the ENGAGE philosophy and to communicate each other their thoughts, experiences and lessons learnt as a result of implementing the ENGAGE materials in the classroom. This community is the place where teachers can put questions, make comments and reflect on which are the best ways to introduce activities aiming to teach RRI skills in their Science lessons.

Considering that many teachers prefer *"to learn from other teachers' experiences"* than participate in Continuous Professional Development programmes, one of the strategies of the ENGAGE consortium was to select "*Expert RRI teachers*" with some specific key roles, in order to attract new teachers in the community, to support them and even mentor the novice teachers in ADOPT and ADAPT stages of the project. According to the DoW, those *"Expert RRI teachers"* are supposed to be teachers who already have expertise in teaching

socio-scientific issues through IBSE, through other projects or innovative curricula, or teachers who registered a successfully progress through the ENGAGE activities (implementing ENGAGE materials in classroom, participating to the workshops or on-line courses). It is assumed that *Expert RRI teachers* can explain better to other community members the RRI philosophy, discuss and give models to implement RRI dimensions in Science lessons, help teachers to adapt/localise ENGAGE materials to the specific country conditions, design or help other teachers to produce *transform* materials in each country. They will be like leaders in RRI teaching in their country, and their main role is to create and maintain a dynamic active community in each country. For achieving this key goal, the Expert RRI teachers must undertake one or more roles (illustrated in Figure 1) in the ENGAGE community of practice function of their domain of expertise, experience and interest.

Figure 12: Key issues related to the roles of Expert RRI teachers for community of practice

In order to identify, recruit and train "*Expert RRI teachers*" or "Transform" stage teachers as mentors for ENGAGE online community, Valahia University of Targoviste team – who lead the partners to identify, recruit and train 'Transform' stage teachers as mentors for online community – designed a tool to be used by each partner for identify the specific aspects related to the possibility to identify and involve their RRI expert teachers in growing the Community of Practice at national level. The aspects that have to be taken into consideration were discussed on different face-to-face meetings and flash meeting organised in the frame of the ENGAGE project.

One first topic of partners' discussions was related to which are the most suitable criteria to identify the *Expert RRI teachers* in each country. The partners identified many criteria for identifying those teachers, but the most underlined issue of the criteria are presented in the Figure 12. The partners mentioned also more other criteria like: Science teachers who currently work as science advisors in schools, with activities aiming

to connect formal and informal learning; Science teachers with whom the partners collaborated in other projects and have acted as reflective practitioners; Science teachers who used successfully the ENGAGE materials in the classroom and transfer their experience during different events (e.g. seminars, conferences); Teachers with long experience in Science teaching, Teachers that showed interest in mentoring other teachers; Teachers who have implemented learning scenarios involving Science centres or researchers; Teachers who participated to ENGAGE on-line courses and written rich comments in the ENGAGE site.

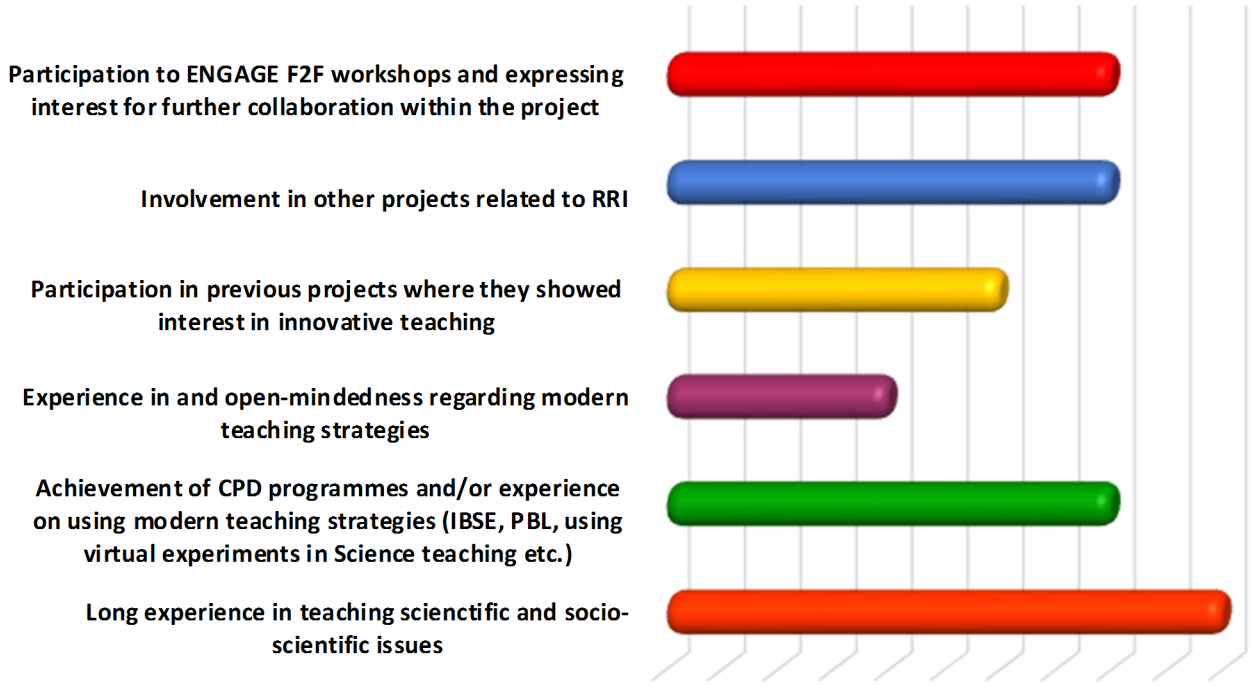


Figure 13: The most suitable criteria specified by the ENGAGE partners to identify Expert RRI teachers in their countries

The next step was to discuss the best ways to identify and recruit potential *Expert RRI teachers* in their countries. After different discussions, the most suitable ways identified are those presented in the Figure 13, which emphasize that most of the partners have a lot of personal contacts with teachers involved in previous projects, with different stakeholders from educational environment, and know / can use network communities that are active in their countries. In addition, by monitoring the teachers' activity on the ENGAGE website, or in the face-to-face workshops and on-line courses organized in the frame of ENGAGE project, each partner will be able to identify also the most interested teachers to develop their experience related to ENGAGE project.

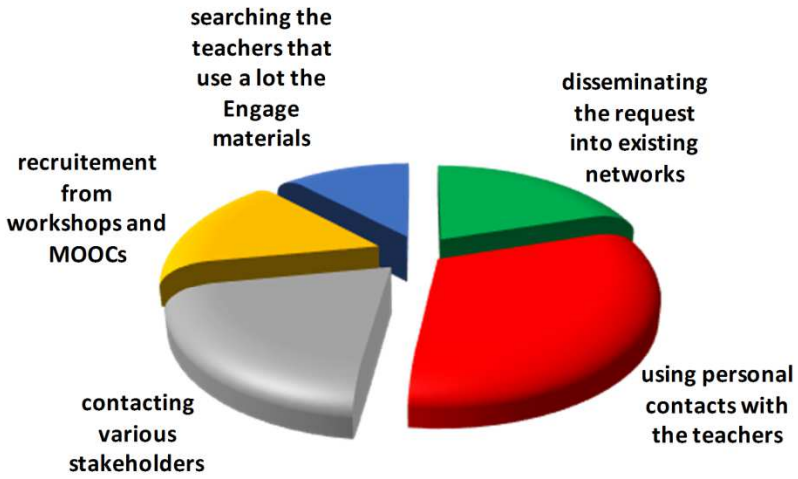


Figure 14: The suitable ways to identify the Expert RRI teachers by ENGAGE partners

Beside the categories mentioned in the previous figure, the ENGAGE partners mentioned also other ways for identifying and recruiting their *Expert RRI teachers*, such as using partners' contacts with different teacher training institutions for in-service and pre-service teachers; finding teachers who act as trainers in official and non-official, but popular CPD providers; identifying teachers who have already done a bit more in the ENGAGE project than attended a workshop/on-line course or give feedback on some materials; looking for the name of teachers who have participated in Science centers outreach programmes; searching teachers that use a lot the Engage materials; encouraging teachers that are ready to help us carrying a research on the impact of the Engage resources.

After identifying of the most active teachers during the previous ENGAGE activities and other teachers who could become *Expert RRI teachers*, each partner developed different activities to recruit those ones for acting as experts or mentors in the ENGAGE community of practice.

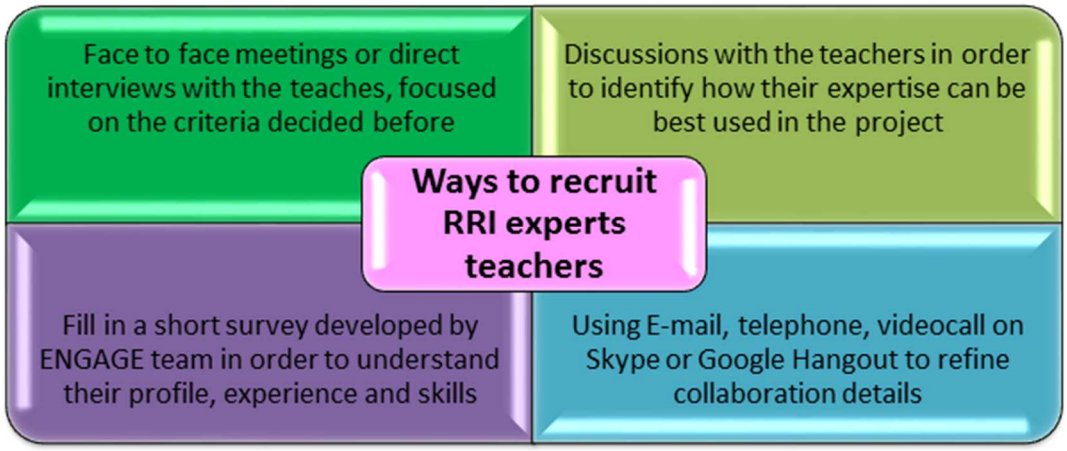


Figure 15: Ways to recruit the Expert RRI teachers by the ENGAGE partners

A lot of partner discussions have been focused on the key issues - related to ENGAGE project - needed to train the experienced teachers identified before, in order to become the next *Expert RRI teachers*. The most important things to be introduced to the EXPERT RRI teachers, specified by partners (illustrated in Figure 15) are the following: the ENGAGE project goals, activities and materials; what is the RRI philosophy in the frame of the ENGAGE project and how RRI dimensions are included in the ENGAGE materials; what are the steps of the 3 stage model for teachers' development presented in ENGAGE project (ADOPT-ADAPT-TRANSFORM) and which are the characteristics of each of those steps; how to be a good facilitator in the ENGAGE community of practice?

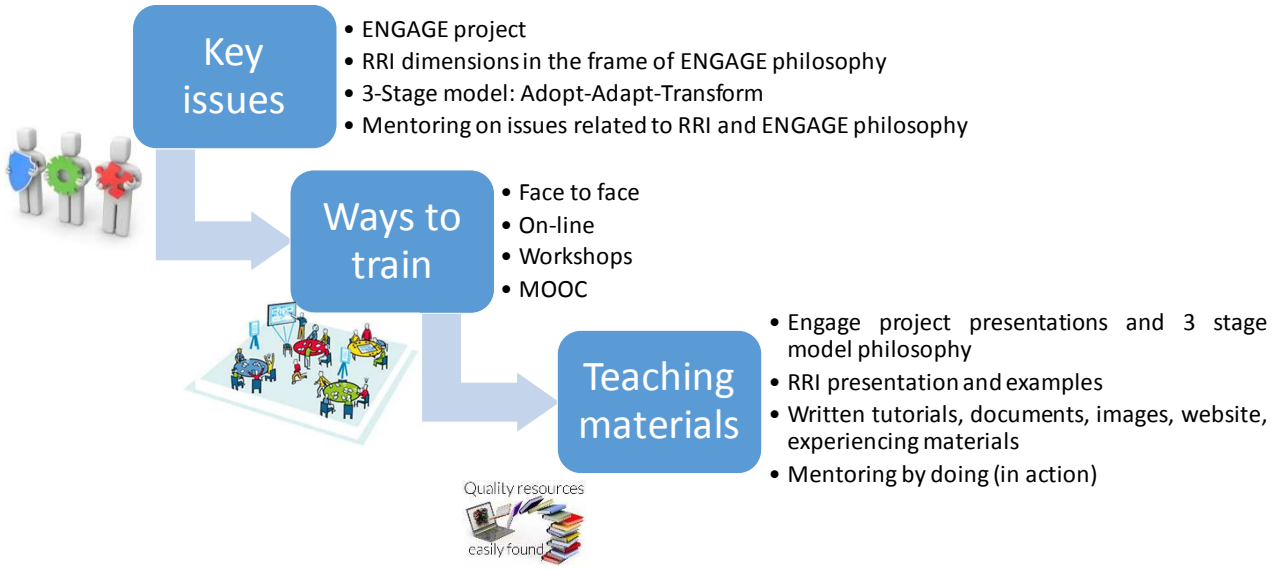


Figure 16: Key issues and ways of teaching the Expert RRI teachers

All partners agreed that those issues can be tackled at face-to-face workshops, on-line courses, Skype or Flash meetings and/or by sending different kind of materials through electronic channels. Figure 5 is also illustrating the main kind of materials proposed by partners to be used for training the experts.

It was decided that each partner will use the most suitable channels to identify, recruit and train its own Expert RRI teachers function of the specific conditions of the country, the level of teachers' experience and knowledge and the possibilities to meet face-to-face or on-line those teachers.

Brokering system

After recruiting and training the Expert RRI teachers/mentors, the partnership decided to use a brokering system in order to create an interface where all the Expert RRI teachers or mentors are to be included. For each of those experts, the domain of expertise, years of experience, short biodata, personal achievements and contact details (e-mail, Skype and Facebook contacts) are presented. Those details will help other teachers - who are members of the ENGAGE community of practice - to enter in contact with the EXPERT RRI teachers/ mentors from their country, or even from abroad. This interface will increase the contacts between the teachers, not only on national, but also on international level.

The role of the brokering system is not only to put in contact teachers with mentors or Expert RRI teachers, but also with researchers, scientists, academicians and others stakeholders that are to be involved in the TRANSFORM stage of the project in each country. This means that the interface of brokering system will be enriched with other kind of stakeholders when the TRANSFORM stage will be developed in each country.

From the technical perspective, the brokering system is implemented as a directory of listings of experts from different areas. The directory is organized in six categories (types of experts): *Expert RRI Teachers / Mentors, Media Experts, Science Museum Representatives, Industry Stakeholders, Researchers / Scientists, Tutors*.

The brokering system is available at the address: http://www.engagingscience.eu/en/brokering/. The first page of the Brokering System is illustrated on Figure 6.

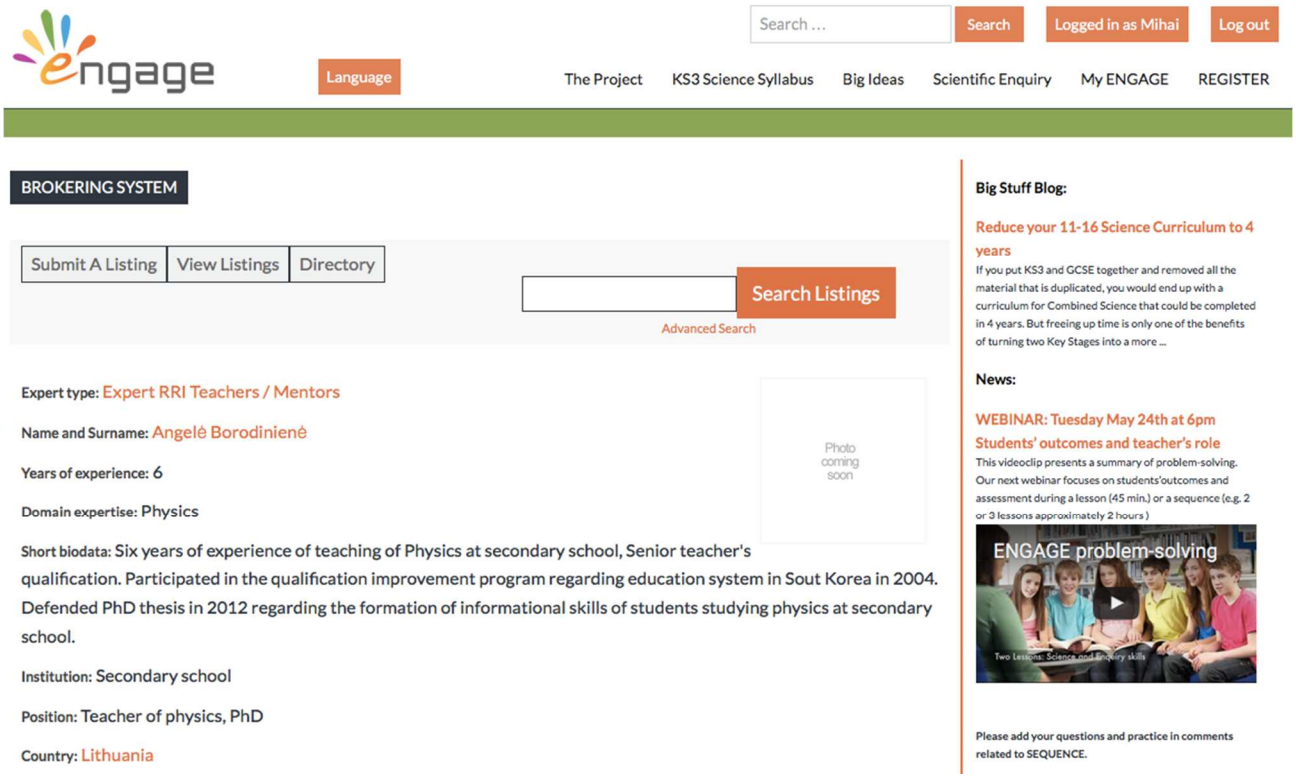


Figure 17: ENGAGE Brokering System interface

The main functions of the brokering system are:

- Browse the directory content (listings and categories);
- View a specific listing (information about a specific expert);
- Submit a new listing (introduce in the database a new expert and information about him);
- Simple and advanced search for a specific listing.

The brokering system is a work in progress. At the moment, there are 17 listings of 16 expert RRI teachers / mentors and 1 researcher. Figure 7 presents an example of listing for a researcher, while Figure 8 illustrates an example of listing of an expert RRI teacher / mentor.

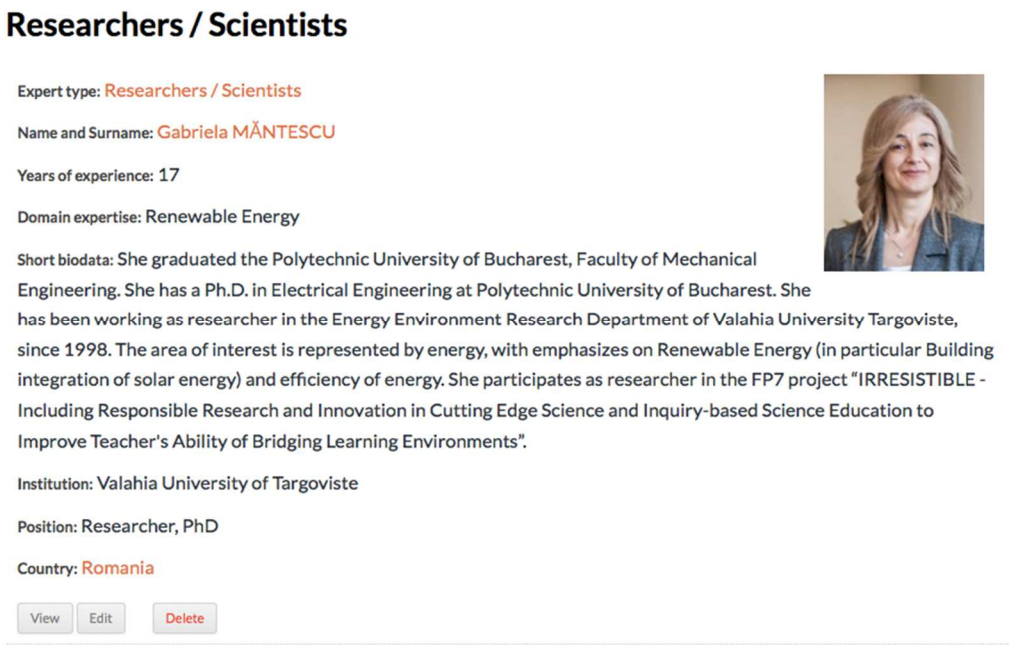


Figure 18: Listing of a researcher in the ENGAGE Brokering System interface

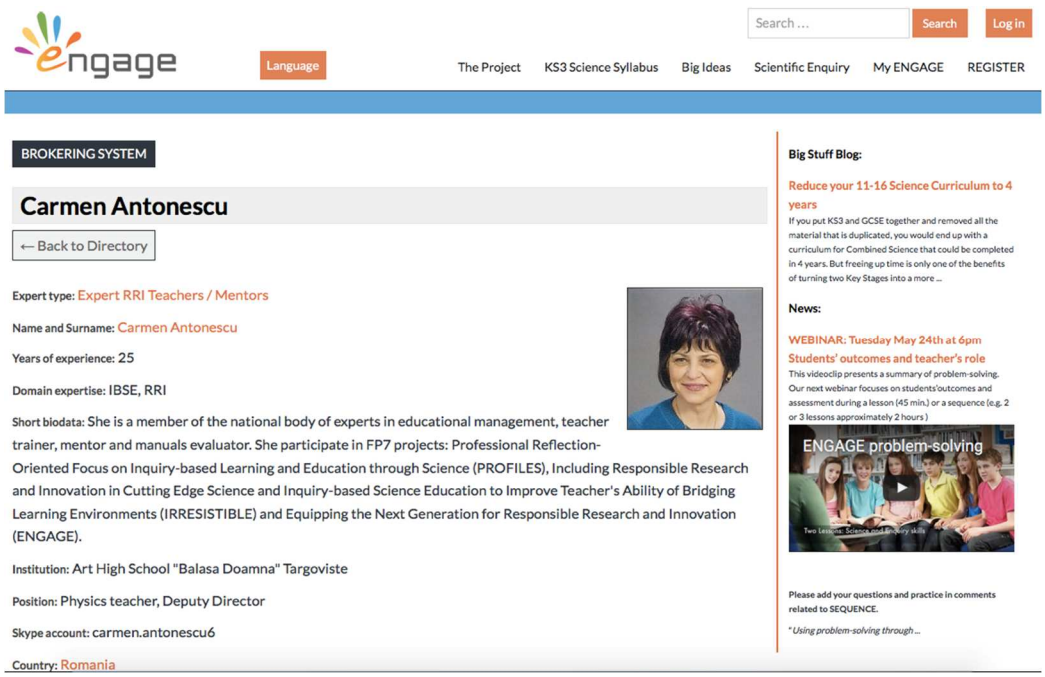


Figure 19: Listing of an expert RRI teacher/ mentor in the ENGAGE Brokering System interface

Any authenticated user in the ENGAGE website can submit one or more listings in the brokering system. Figure 9 presents the top of the web form used for adding a new listing.

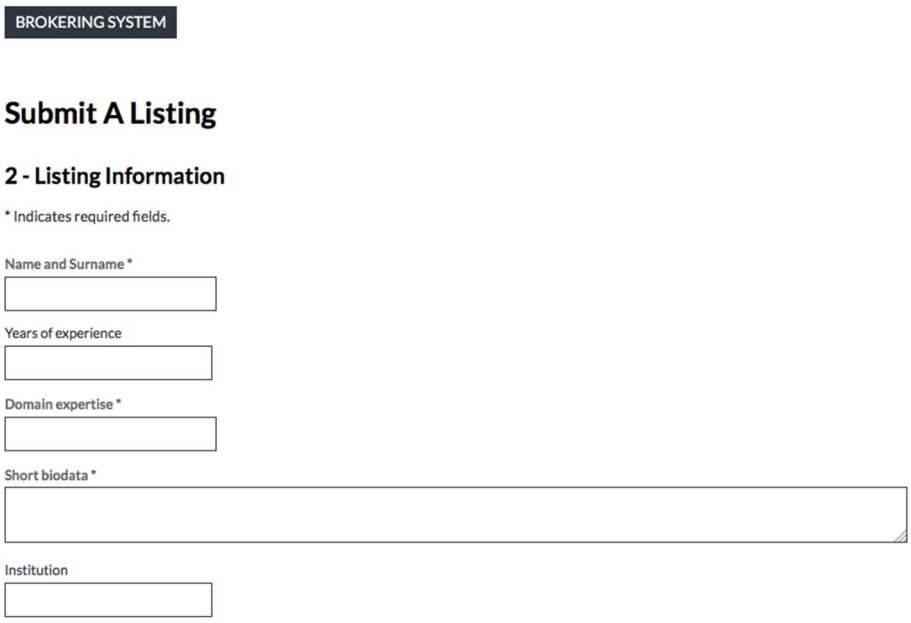


Figure 20: Form for submitting a listing in the ENGAGE Brokering System interface

Seeding and managing an online community of practice

On the basis of the DoW, UB elaborated guidelines for seeding and managing National online communities of practice for teacher reflection and exchange with other teachers and mentors. The document is available Appendix 2, and it aims to help mentors to foster interactions in 3 axis:

1) Sharing their experience in applying the ADOPT materials in the classroom, in terms of student reactions and outcomes, problems arisen, etc.
2) Sharing their experience in applying the ADAPT CPD tools, as divided into the stages that compose the problem solving tool and the conversation tool
3) Encourage teachers to ask questions, either from the scope of preparing an ENGAGE lesson or reflecting on it.

At a practical level, the technical infrastructure to support interaction in the community was discussed at a consortium level. The following alternatives were considered:

a) A separate section of the website called “forums”, where teachers and mentors can open discussion topics about one or more ENGAGE materials on a single place
b) Placing the discussions in the comments section of each material

UB led a discussion with ADAPT partners with the goal to choose the most convenient strategy. There was a majority of partners who preferred option b), namely Norway, Switzerland, Lithuania, UK and Spain. For this

reason, it was decided to use the comments section of each material. This decision was communicated to all partners via ASANA.

To date, ADAPT partners have undertaken actions to foster the creation of a community of practice in their national Knowledge Hubs, as shown in table below.

Country / Strategy	Number of comments to ADAPT materials	Ratings to ADAPT materials
UK	25	34
Greece	0*	1
Germany	4	8
France	4	0
Romania	73	67
Israel	0	7
Spain	40	13
Norway	0	8
Switzerland	9	8
Lithuania	47	19
Cyprus	48	0

(*)No comments in the ENGAGE platform but we have comments in the EDX platform of our on-line course

As shown in the table, Lithuania and Spain are two of the most successful countries in terms of comments to the ADAPT materials. At this stage, mentors play a crucial role. In order to illustrate this phenomenon, below we provide an example of an interaction taking place in the community.

Comment by Jesusgasco (Spanish teacher, ENGAGE user): *I think it is a very interesting resource. Learning about physics, or any discipline, in context, is a more effective way for students to feel attracted to what you're explaining. At the same time, by using dilemmas we are helping them to develop their critical thinking skills or, at least, to reflect and think. However, I'm not so sure that this material is suitable for the education level recommended (2nd of ESO). I may be wrong but I have the feeling that while in the section of the game can motivate them to discuss, other activities may be a bit too difficult for them.*

Answer by Jordidomenech (Spanish ENGAGE mentor): *It's true: the activity includes complex physical content, such as frictional force, the resultant force, or the maximum speed, which conceptually are located in 4th of ESO. Still, concepts such as mechanical calculation of resulting composite forces, which would require trigonometry, are not used. This means that it can be adapted to 2nd of ESO, not as an introduction to the subject but as an enforcement activity. Also students need to know how to interpret a graph in order to complete the final part of the activity.*

Despite this, and as it can be seen by the numbers on the table, several ADAPT countries have reported challenges to motivate teachers to participate in the community, as shown below.

United Kingdom: We are struggling to set up a community as such. However we have just started a MOOC successfully with initially 153 sign up with 60+ started the course. In the UK the notion of self-promotion to ADAPT is proving popular with teachers. There is a reasonable level of positive materials comments being generated on the web in the UK. 634 of our 6132 users have registered themselves as advanced users this is close to 10% of our users.

Germany: All the actions we took so far – and we took a lot – didn't support the community development. Feedback via voting, commenting and questionnaire – statement from the teacher community "we don't comment on the web, this is something a German teacher doesn't do"…Obviously with some exceptions

France: So far, we have not (even with a strong dissemination) enough teachers registered. I see two reasons mainly: 1. Traces is not identify as a teacher CPD organisation 2. The context in France (after attacks and changing of curriculum). Our strategy is to get involve in third parties events and to have short version of the F2F.

Romania: The Romanian teachers are not so active in comments. Most of them did not fill in the short questionnaire in order to have the possibility to download the ADAPT materials. We have just started to 2nd edition of the on-line course (ADOPT+ADAPT) and we hope we will have better figures when we will arrive at ADAPT part of the course.

Israel: Most of comments and posts are for ADOPT materials since ADAPT materials did not exist on 2015 in the Israeli site.

Spain: Our four mentors publish comments every time they use a material in the classroom. They share teaching strategies used, and they ask questions to other teachers so to foster discussion.

Norway: the Norwegian teachers are generally not active in commenting unless we force them (Which we will do in the MOOC), so since there is only 6 adapters and not much more downloads, we probably see much difference before the MOOC starts.

Switzerland: Whenever we had a workshop, we asked the participants to write comments as a way to evaluate the material.

Lithuania: It seems that not everything is going very well, especially with mentor teachers. We had 3 of them, but now I see that we should "find a cake" for them to start communicating on the website. It seemed to be not easy.

UB has analysed these concerns and provides possible solutions in the last section of the present document.

4. SUCCESS STORIES

This section aims to report on especially successful dissemination actions in ADAPT countries, which have led to individual teachers who have made a purposeful use of the ADAPT materials in the classroom.

4.1. Spain

The secondary school teacher Jordi Domènech used the ADAPT material “2 degrees” with his students (see image below) of the public secondary school in Granollers (Spain).

Figure 21: Tweet by a teacher reporting on the implementation of the ADAPT material "2 degrees"

As a result of using the materials, he published a comment on the Spanish Knowledge Hub:

Hi! This activity works very well, I find very interesting fact in the debate include nuclear energy, which sometimes is forgotten when talking about energy sources in relation to carbon dioxide. By using the sheets and printed materials, sometimes I find myself talking without looking at the students, worrying about giving each group of students the appropriate printed material. To solve it was useful to have 3-4 student assistants: I tell them how the lesson goes beforehand, and they are responsible for distributing the material. Sometimes I choose students who get distracted in more conventional activities and I give them a responsibility. It is pleasant to have allies for the activity and feel that they are involved. Do you have other tips to implement the activities?

As shown in image below, a teacher called Rafael Montero has reported in twitter the use of the “Animal testing” ADAPT material at the school “Colegio Corazón de María” in Gijón (Spain).

Figure 22: Tweet by a teacher reporting on the implementation of the ADAPT material "Animal testing"

The following comment, which he published at the Spanish Knowledge Hub, shows how he integrated the lesson in his teaching plan, as well as the reactions from his students:

I really liked that the material is structured in two lessons, where the first deals with the scientific content and the second with the ethical aspects. I think that in this way the activity becomes interdisciplinary, thus tackling the content from different subjects. As it happens with other ENGAGE materials, the PowerPoint presentations, the student sheets and the activity development are very good and can be used immediately in the classroom leading to very satisfactory student results.

4.2.Israel

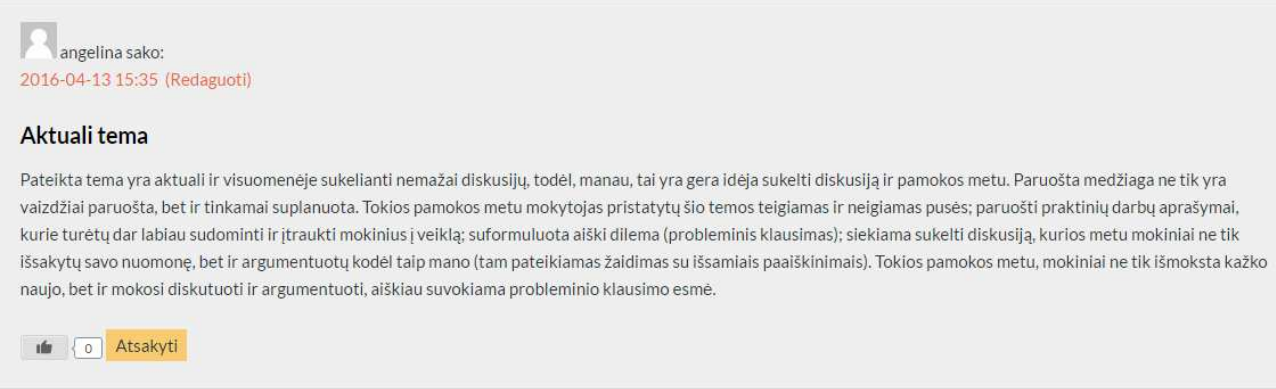
Nurt Dekalo, who is a chemistry teacher, wrote:

On last Monday, 29/2/2016, we conducted the first conference for chemistry students of Petah-Tikva City in our Multi-Disciplinary school ("Rav-Thumi Petah-TikvaBet"). 5 schools participated in the conference. In the second phase of the conference, students exhibited their works, and in another phase, 11th and 12thgraders from our school and from other schools made a fascinating discussion about plastic bags, following the instructions from the ENGAGE project materials.
Our school students were required to be "the experts" in the field, and the other students asked them

questions about the subject. Finally, the students decided to recommend on using biodegradable bags. At the end of the discussion, the students reported that the activity was interesting and that they had had fun. Some of them reported that they want to know a little more, and to become experts in the subject.

4.3.Lithuania

A teacher of Biology called Angelina Bobnis used the ADAPT material "To frack or not?" and wrote a comment in Lithuanian Knowledge Hub.


angelina sako:
2016-04-13 15:35 (Redaguoti)

Aktuali tema

Pateikta tema yra aktuali ir visuomenėje sukelianti nemažai diskusijų, todėl, manau, tai yra gera idėja sukelti diskusiją ir pamokos metu. Paruošta medžiaga ne tik yra vaizdžiai paruošta, bet ir tinkamai suplanuota. Tokios pamokos metu mokytojas pristatytų šio temos teigiamas ir neigiamas pusės; paruošti praktinių darbų aprašymai, kurie turėtų dar labiau sudominti ir įtraukti mokinius į veiklą; suformuluota aiški dilema (probleminis klausimas); siekiama sukelti diskusiją, kurios metu mokiniai ne tik išsakytų savo nuomonę, bet ir argumentuotų kodėl taip mano (tam pateikiamas žaidimas su išsamiais paaiškinimais). Tokios pamokos metu, mokiniai ne tik išmoksta kažko naujo, bet ir mokosi diskutuoti ir argumentuoti, aiškiau suvokiama probleminio klausimo esmė.

0 Atsakyti

"The *topic presented is very actual and it raises many discussions in the society, so it is a very good idea to start a discussion during a lesson as well. The teaching material is not well prepared visually, but it has a very clever plan as well. A teacher can introduce positive and negative sides of the theme. Descriptions of practical activities are prepared, which engage students and attract them to perform these activities. There is a clear dilemma (problematic question). It is intended to organize a group discussion where pupils express not their opinions, but they have to proof it with arguments (a play with explanations is presented). So students get new knowledge and acquire skills of communication and argumentation during such type of lessons, as well as understand problematic questions*."

4.1.United Kingdom

In the UK the ENGAGE materials and their approach have proved powerful in a national context in that they been influential towards the development of new curriculum at a national level through the AQA key stage 3 Science curriculum draft, as shown here:
http://www.aqa.org.uk/subjects/science/ks3/ks3-science-syllabus?utm_source=syllabus&utm_medium=onlinepdf&utm_campaign=Ks3science

5. LESSONS LEARNT AND RECOMMENDATIONS

In this Deliverable we have reported on how the teacher inquiry cycle has been implemented for the ADAPT stage of teacher professional development in ENGAGE. Mainly, the goal of ADAPT is to promote a deeper commitment to RRI teaching than in ADOPT. Such commitment consists in training teachers in explicitly teaching RRI skills to students with the help of the ENGAGE learning materials, online CPD courses and local community of practice. The implementation of the model in 11 countries has enabled to review it, and to come up with improvements for its next iteration, which are provided next in this section.

5.1.Materials

As it shown in Appendix 3 – National ADAPT dissemination reports, a wide range of dissemination activities have been used to promote the widespread adoption of the ADAPT materials. Most actions have been online, such as email marketing, newsletters and posts in teacher websites.

Face-to-face presentations of the ENGAGE materials have proven to be successful in some countries, especially those in which a close relationship between the ENGAGE team and the teachers has been established, such as Switzerland and Israel.

Feedback received from teachers reveals the following strengths:

- Relevance to students' life
- Students engage in the game
- Fits well the curriculum

Getting teachers to join the ADAPT part of the Knowledge Hub was challenging at the beginning, but most countries are making good progress towards the targets. The most successful strategy on this direction has been to merge the ADOPT and the ADAPT parts of the MOOC. In this way, teachers can get self-promoted to ADAPT as part of the MOOC.

In Norway, Germany, and Spain teachers have expressed the difficulties to implement materials which take 2 lessons. For this reason, as part of the dissemination activity for ADAPT second year, efforts should be devoted to explain the reasoning behind this choice.

5.2. MOOC

As a result of disseminating and delivering the online course in partner countries, and considering the particular situation of each country, we have identified a set of successful strategies:

- Deliver the online course in collaboration with an in-service teacher training provider. This organisation helps to disseminate the course and may offer extra motivation for teachers if they can award an official certification

- Choosing the date of implementation of the MOOC so that it doesn't overlap with the period in which teachers are busy, such as beginning or end of the trimester or assessment periods. Some partners are considering to deliver the course, or at least part of it during holidays period. This enables teachers to devote more time to the course, but it prevents them from implementing the materials in the classroom. A solution for this could be to deliver the first part of the course during the holidays and then

In order to make up for the time invested in developing the ADOPT CPD, several partners decided to deliver a joint version of the online courses, which included ADOPT and ADAPT stages in a period of 6 weeks. For each stage, the course included presentations, readings, videos and classroom practice. Some countries have reported that teachers would need more time for classroom implementation.

At a technical level, partners have highlighted some aspects of the platform which could be improved:

- Single login on the Knowledge Hub (Wordpress) to access the online course (EDX)
- Error 505
- Course facilitators receive notifications of new enrolled users
- Users get notified of answers to their forum posts in the course
- Users should be able to see their progress on the course
- More videos
- Automatic grading assignments such as quizzes

5.3. Community

During the first year of ADAPT implementation, partners have selected and trained expert teachers to become mentors in the community. UB has elaborated a set of guidelines for partners, which include ideas on the kind of comments that mentors can publish on the ENGAGE materials. Sharing their experience has been recommended, as well as posing questions so that teachers interact as well.

The use of other interactive features such as "like" to materials and comments, as well as ratings, has been encouraged and it is currently at an early stage. We have shown how teachers publish comments with contributions to the materials, such as videos or links to scientific articles.

However, the number of interactions between mentors and teachers could be improved. There are reasons to think that teachers need a stronger motivation to comment on the site. UB has analysed the situation and the following recommendations are made for the next ADAPT iteration:

- Users get subscribed to answers to their comments by default
- As part of the MOOC, include an activity which consists of publishing a comment on a material
- Send email marketing campaigns to introduce mentors, and to encourage teachers to ask them questions
- Promote and facilitate that the community created around the MOOCs gets transferred to the Knowledge Hub after the course ends.

APPENDIX 1: STRATEGIES TO MEET ADAPT TARGETS

After some months of ADAPT implementation, UB has collected feedback from partners on the challenges they are meeting and has provided solutions (see table below).

Challenges mentioned by partners in monthly monitoring form	Suggestions provided by UB to tackle those challenges
tight schedule classroom practice of ADOPT + ADAPT in a 6 week-long course	Increasing the length of the course, while keeping the number of hours, in order to reduce dedication time
The RRI concept is new for the Romanian Science teachers from secondary level. They are very anchored in the curriculum and time limitations. The ADAPT stage request a higher effort from their part and more time to be spend in order to rethink how to plan their lessons and how to teach Science through RRI dimensions. We need more time to convince them not only that they have to do it, but especially to learn them how to do it. As for the numbers... it will be really hard to achieve them in this situation.	Make explicit the link to the ENGAGE RRI skills to the skills that they are obliged to help students to acquire by the Romanian curriculum. In Spain, most ENGAGE RRI skills are in the curriculum, the only problem is that teachers are not used to teach them. For this reason it could be a good idea to incorporate a first section of the MOOC on "how is this linked to the Romanian curriculum?" You can even ask teachers to do the mapping or to reflect about it by themselves and then post the result in the forum.
It has proven more efficient for us to work with personal contacts so it might not be that easy to reach a very high number of participants.	Try to achieve the number of participants stated in the DoW with a wide but targeted dissemination strategy
Because the course is organized only in the on-line form and not face-to-face we won't be able to certify this course at the national level in Romania and we won't have possibilities to give transferable credits to the teachers. For this reason we will have a lower teachers' interest for this course since in Romania we have a lot of accredited courses and teachers need to get a minimum number of credits in a period of 5 years for their personal development. This can create us a problem to get the number of teachers who finish the on-line courses.	You can include face-to-face sessions or videoconference if this doesn't mean that you will get less teachers enrolled
I think we reached the goals mentioned above. Maybe we attracted too many teachers - it was difficult to react very quickly to so many mails and comments....	Try to promote interactions among teachers, not relying so much on the course facilitator
Motivating teachers to continue and move to adapt.	Make explicit the fact that this is a trend that can't be stopped, Europe is moving towards RRI, most curriculums include it, teachers must feel they are making an investment for the future
Participation to the online community and to the MOOC. There will be a lot of change in the curriculum next year and teachers are focusing on this changes for their training. We also have the greatest difficulties to mobilise teachers after Paris attacks.	Make explicit the fact that this is a trend that can't be stopped, Europe is moving towards RRI, most curriculums include it, teachers must feel they are making an investment for the future
Teachers are very busy at this time of year. Final deliveries, exams and Christmas holidays come together. With the start of the second semester in	Try to place your dissemination campaigns and your courses at a moment in which teachers are not so busy

January, we expect to get going again.	
We cannot give credits at the end of the on-line course, because we cannot certify the course with only on-line activities. Some of the potential participants are not interested to participate to the course if they don't get credits. RRI is something new for Romanian teachers and takes time to understand the philosophy and convince them to adapt their regular lessons in order to implement ENGAGE materials. Then we have to learn them how to do it. The most often teachers' argument is related to the strict curriculum they have to teach and lack of time to do it.	Make explicit the link to the ENGAGE RRI skills to the skills that they are obliged to help students to acquire by the Romanian curriculum. In Spain, most ENGAGE RRI skills are in the curriculum, the only problem is that teachers are not used to teach them. For this reason it could be a good idea to incorporate a first section of the MOOC on "how is this linked to the Romanian curriculum?" You can even ask teachers to do the mapping or to reflect about it by themselves and then post the result in the forum.
A continuous effort will be necessary to achieve the numbers for Switzerland. We are optimistic. It is possible that we may have more participants for workshops than for MOOCs. This would be actually better, we think.	You can ask teachers to interact in the online learning environment during a face-to-face workshop
In our country, there are different languages. As the materials are in Spanish, teachers are sometimes reluctant, but we are promoting its use as well as easy to translate if necessary, and edit the language of PowerPoint is very easy. Some teachers have sent us comments, saying they want to do training to learn to make their own materials.	Encourage teachers to translate materials into local language as an investment
Technical problems with MOOC	EDX update
Teachers reported that it is hard to introduce the materials as they are in the normal curriculum of Romania. They tried for one lesson, but most of them consider that the best period of implementation this kind of materials is during the special week "School in another way". In this week teachers can organize different kind of activities (at their disposal) related to the Romanian curriculum. Due to these aspects it will be hard to convince so many teachers to implement ENGAGE materials in the Romanian regular classes. But we are struggling to achieve the figures.	Help teachers to select the materials which fit with the curriculum, give teachers some time between lesson preparation and lesson implementation (increase the length of the course)
The first three ADAPT materials have been markedly less popular among our users than the ADOPT materials (only 7 downloads in the 2 months since November - 5 of these are teacher guides). In particular there is currently not one single download of any of the materials for Lesson 2. In short, the first materials have not been very successful among the Norwegian Teachers. If this is a general trend for several countries the Project should reconsider the current format for the materials. As for the MOOCs the content seems quite useful. There have been some technical issues, but we expect these will be resolved in the next version of the platform	The project already considers that the number of ADAPT teachers will be lower than the number of ADOPT teachers. The teacher progression model planned for ENAGE is like a funnel. One idea could be to convince teachers that RRI is the way forward and to make explicit how these materials enable them to address parts of the curriculum that they must teach anyway.

APPENDIX 2: GUIDELINES FOR SEEDING AND MANAGING NATIONAL COMMUNITIES OF PRACTICE

Mentors write comments to the materials and / or blog posts, where they **share their experience** and **ask questions** to foster discussion. Partners can ask mentors to do the following:

- **Sharing their experience with the ADOPT materials and CPD tools:**
  - Dilemma: *How did students react to the dilemma? Did they look interested by it?*
  - Group discussion: *How did you organise and prepare the discussion? How did the discussion evolve? Which problems arose?*
- **Sharing their experience in applying ADAPT CPD tools:**
  - For problem solving tool, as it is composed by 6 stages:
    - ENGAGE (lesson 1):
      - *Explain how you captured student's attention with the context. For instance: as soon as I showed the slide with the animals which are used to test new drugs, they started to talk about whether that's right or wrong, by using very emotional arguments such as "I have a rabbit as a pet"...*
      - *Explain how you presented the learning objectives of the lesson.*
    - REVIEW (lesson 1)
      - *Indicate how you helped students recall the key concepts, and apply them in an unfamiliar context. For instance, in E-cigarettes, students represent their knowledge about molecules with diagrams. Another example: asthma in "animal testing"*
    - CONSIDER (lesson 1):
      - *Describe the discussion that took place in which students think about what they have learnt about the science content needed to answer the problem posed in lesson 1.*
      - *Explain how students worked with the scientific evidence to solve the problem.*
    - RE-ENGAGE (lesson 2):
      - How did you remind students of the key points of the lesson?
    - PLAY (lesson 2):
      - *Explain how you framed the problem as a challenge for students, so that they developed a "need to know". For instance, in "animal testing" the teacher conveys that it is very difficult to decide about the arguments for and against using animals.*
      - *Indicate to what extent students were familiar with the game proposed.*
      - *Describe how you guided students in practising the RRI skills tackled in the material. For example, "weigh up risks" in animal testing.*
    - DECIDE (lesson 2):
      - *Indicate how students used the RRI skills practised in this material to provide a solution to the problem.*
  - For conversation tool, on its 4 dimensions:
    - PREPARATION ACTIVITIES
      - *Describe the use that students made of the claim-evidence-reasoning framework.*
    - FISHBOWL FORMAT

        - *Describe the engagement of students inside the fishbowl. Provide evidence that students outside the fishbowl were listening and analysing what is being said.*
    - ACTIVE PARTICIPATION STRATEGIES
        - *What kind of contributions to the discussion did students make?*
    - MANAGEMENT TECHNIQUES
        - *Describe how you managed time and student participation in the conversation.*
- **Encourage other teachers to ask questions regarding:**
    - Lesson preparation: *is the lesson outline clear? What other materials would you add? What do you expect from students?*
    - Lesson reflection: *was there any unclear part of the lesson? Any suggestions for improving the material?*

APPENDIX 3: NATIONAL REPORTS ON ADAPT DISSEMINATION

United Kingdom

Dissemination activities performed (October 2015 – April 2016)

Status (done/ planned)	Date	Activity title	Tools used (URLs of web sites, blogs or other means)	Activity disseminated? Materials / CoP / MOOC (select)	Estimated number of people reached and level of involvement
done	21-11-15	ASE – Huddersfield ENGAGE	Web site various activities	F2F briefing session 1 hour	12
done	1-12-15	ENGAGE F2F CPD session	As closing part of F2F adopt CPD session teachers were introduced to Adapt materials	F2F briefing where teachers promoted themselves to advanced users	6
ongoing	20-4-16	MOOC	EdX platform	MOOC	153 (interest) 60+ attending

Materials

- Animal testing - 556
- e-cigarettes - 894
- 2 degrees - 945
- Man or machine? - 495
- Fracking - 537

Selected ADAPT dissemination highlights

One teacher from our session on 1-12-15 Jane (see picture below) planned to use the Animal Testing materials as part of a 'Big Question' cross curricular type activity across her school.

Figure 23: Jane shows her plan to include an ADAPT material in her teaching

Another success story at a quantitative level would be that 634 of our 6132 users have registered themselves as advanced users. This is close to 10% of our users.

Way forward

MATERIALS: we need to carefully check whether those who attend our MOOCs are then more keen to engage with adapt style materials and their additional content.

COMMUNITY: We need to create and nurture a community atmosphere more fully. This also linked to identifying more expert type teachers.

Greece

Dissemination activities performed (October 2015 – April 2016)

Status (done/ planned)	Date	Activity title	Tools used (URLs of web sites, blogs or other means)	Activity disseminated? Materials / CoP / MOOC (select)	Estimated number of people reached and level of involvement
Done	Oct 2015	Researcher's night Heraklion	Demonstration	Materials	More than 200

Done	Dec 2015	Massive emailing to ADOPT users	Emailing list via our personal email	Materials	150
Done	January 2016	Massive emailing to ADOPT users	Emailing list via our personal email	Materials	160
Done	28 January 2016	F2f presentation of materials in local teachers	Website, leaflets	Materials and MOOC	18
Done	Feb. 2016	On-line meeting with a private school director	Website	Materials and MOOC	5 science teachers of the school (high involvement)
Done	18 April 2016	Dissemination of MOOC to the association of Cretan physicists	Newsletter send by the association to all its members	MOOC	More than 200
Done	23-24 March 2016	2 days event for ENGAGE in ASPAITE Patra (pre-service and in-service teacher training institution)	Face to face demonstration of the materials, website and leaflets	Materilas, MOOC and CoP	More than 148

Dissemination screenshots

Figure 24: Dissemination event in Researcher's night, Heraklion, Crete

The two days event in ASPAITE teacher training institution has also been successful: in-service and pre-service teachers from various disciplines had the opportunity to be acquainted with the ENGAGE ADAPT materials and exchanged ideas on how to use the materials in a cross-disciplinary way. For example an Economics' teacher commented: "*I would really like to teach the material "e-cigarettes" together with a physicist and a biologist…socio-scientific issues are not only relevant for science teachers, and STEM subjects, there are economic implications as well, that students need to take into account and for which my discipline (economics) gave give useful insights)". (*Comment by male in-service economics' teacher in vocational secondary school, 24th March 2016, ASPAITE). Most important, the instructor of the ASPAITE which invited us to implement the event in ASPAITE, has been very excited with the materials and has informed us that she has decided to use them in her course when teaching socio-scientific issues during the second semester of academic year 2015-16.

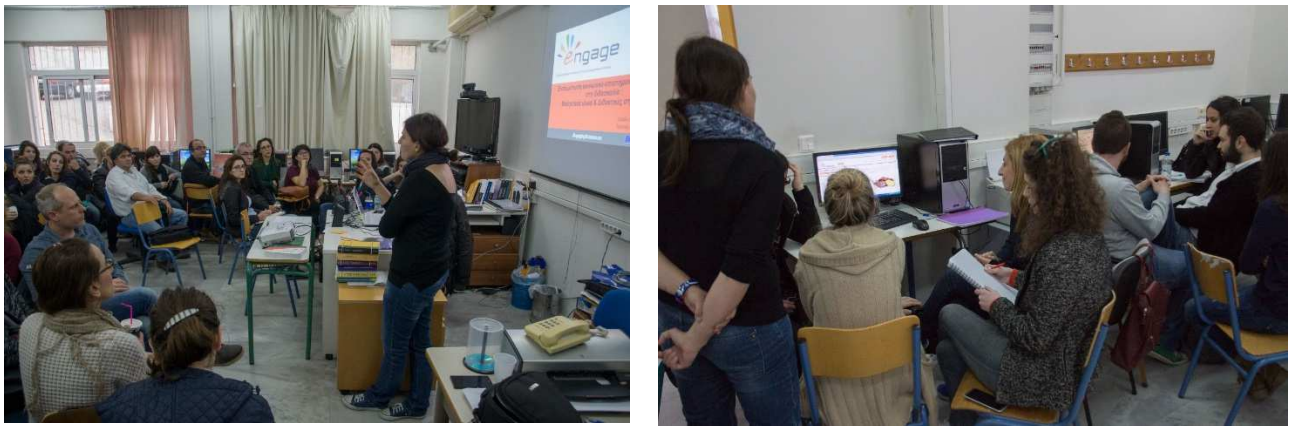


Figure 25: Dissemination event in ASPAITE

Figure 26: Dissemination event in January 2016

Selected dissemination highlights

The Greek online course (ADOPT & ADAPT) has attracted the interest of many teachers (56 enrolled) who participate actively in the discussion forums. Teachers have provided feedback on the ADPAT materials, an example of which is provided below (for the material “Animal Testing”):

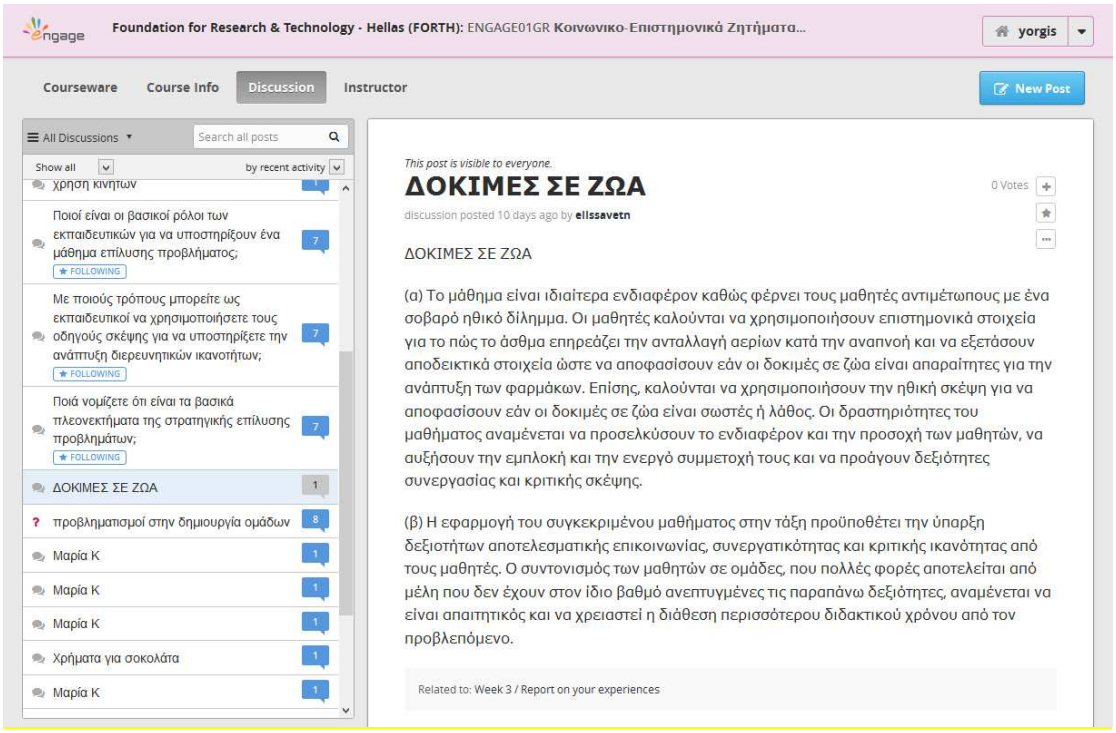


Figure 27: Screenshot from the on-line course platform

"The course work is expected to attract the interest and attention of students, increase engagement and active participation and to promote cooperation and critical thinking skills. The implementation of this course presupposes the existence of effective communication skills, collaborative and critical ability of the students. The allocation of students in groups, often composed of members who are not equally developed these skills will be demanding and require the allocation of more teaching time than expected." (post by female teacher in the discussion forum of ADAPT Greek online course, 25/04-29/05/2016).

Materials

- Animal testing (54 downloads)
- e-cigarettes (12 downloads)
- 2 degrees -
- Man or machine? -
- Fracking -

Way forward

MATERIALS

During May 2016 we have managed to increase considerably the ADAPT users (23 ADAPTERS on May 15th from 7 in February), but we still need to work further to meet the targets. The on-line course has helped to increase registrations as teachers were requested in week 3 to become ADAPT users and download the

materials. Also in week 4 we had an assignment on ADAPT materials for teaching strategies problem solving and conversation.

ONLINE COURSE

The Greek online course (which is still being running at the time this report is written) has recruited 56 teachers who participate actively in the discussion forums. Next on-line course is planned for October 2016, in which we expect to meet the targets for on-line course participation as promised in the DoW.

COMMUNITY

Teachers who are registered in the on-line course are a very active on-line ADAPT community. Our target is to try to "move" this community from the online-course platform to the ENGAGE platform, so that in the new ADAPT materials that are published these people provide comments and discuss. We are going to advertise this as a follow-up activity of the online course.

Germany

Dissemination activities performed (October 2015 – April 2016)

Status (done/ planned)	Date	Activity title	Tools used (URLs of web sites, blogs or other means)	Activity disseminated? Materials / CoP / MOOC (select)	Estimated number of people reached and level of involvement
Done	27.10.2015	Presentation and information desk	https://www.youtube.com/watch?v=yYVlb0De-_4	Materials, Workshops and MOOC	
Done	22.1.2015	Presentation	Engage Website ENGAGE FILM: https://www.youtube.com/watch?v=yYVlb0De-_4	Materials and MOOC	5 presence and 500 via Newsletter from the organisation
Done	Year 2015	Presentation of the project and materials	Lehrer .online website http://www.lehrer-online.de/engage.php	Materials	500000 Subsscribers of the Newsletter
Done	January-April	Press releases and articles to	Communication via E-Mail and different	Materials, Workshop	Difficult to tell but around 2000 People and

	2016	all Teachers trainings in Germany	Phone-calls ENGAGE FILM: https://www.youtube.com/watch?v=yYVlb0De-_4	and MOOC	potentially much more over the articles in the websites
Done	27. January 2016	Presentaiton at the FAU for didactic departmensts	Presentation and ENGAGE ilm: https://www.youtube.com/watch?v=yYVlb0De-_4	Materials and MOOC	12 (and student teachers as potential beneficiaries)
Done	18.3.2016Workshop in Stuzttgart	Workshop	Presentation, Discussion, etc.	Materials and ENGAGE pedagogy	12 participants
Done	7.4.2016 Leipzig	Workshop	Presentation, Discussion, etc.	Materials and ENGAGE pedagogy	4 Participants
Planned	14.6.2015	Presentation at the EDEN Conference in Budapest	Presentation and Discussion	Materials, pedagogy and MooC	350 Participants
Planned	6.7.2016	Presentation at the EDULEARN 2016 in Barcelona	Presentation and Discussion	Materials, MOOC and Pedagogy	500 Participants
Planned	June 2016	Workshop in Erlangen	Presentation and Discussion	Materials, MOOC and Pedagogy	30 Participants
Planned	Mai-July	Articles in different newsletter and online portals		Materials, MOOC and Pedagogy	

Dissemination screenshots

Materials

- Animal testing (31)
- e-cigarettes (45)
- 2 degrees (27)
- Man or machine? (5)
- Fracking (4)
- ZIKA (19)

Way forward

MATERIALS:

For the German teachers the materials are interesting but they do have problems using the adapt materials in their classes because a) they don't match the curriculum, b) they are too long c) the science is not long enough. We will keep on contact all different types of organisations related to teachers training as well as teachers associations. The direct contact to schools is too time consuming with little outcomes. Furthermore, we are re-writing the MOOC- Making it shorter and more dedicated to the needs of the German teachers. At the moment much information is redundant to German Teachers (in Germany you study to become a teacher and things like dilemma in the classroom, group discussion, and problem-based learning are part of the curriculum. It is not a novelty to German teachers.

Furthermore we consider skipping the registration for download, because this is a major barrier for the teachers.

ONLINE COURSE:

- We tried the Online course with some teachers and are now rewriting it for the German needs

COMMUNITY:

It is naive to assume that German teachers will start commenting on the materials. This is a cultural issue and we assume that we are not going to have high numbers of comments and voting.

For Community reasons we have a Newsletter with 300 recipients at the moment

France

Dissemination activities performed (October 2015 – April 2016)

Status (done/ planned)	Date	Activity title	Tools used (URLs of web sites, blogs or other means)	Activity disseminated? Materials / CoP / MOOC (select)	Estimated number of people reached and level of involvement
DONE	4-5/12/2015	Forum des enseignants innovants et de l'innovation éducative	1 both for two days + one-pager flyer	All	50
DONE	9/12/2015	Solutions COP21	1 booth during the afternoon at a COP21 event in the Grand Palais (Paris) for teachers and other	Materials	30

			publics		
DONE	20/01/2016	Apéro-forum	1 stand at an event for teachers in the Espace des Sciences Pierre-Gilles de Gennes (science center)	All	15
DONE	2/04/2016	La nuit des débats	1 oral presentation about ENGAGE for teachers	All	10

Dissemination screenshots

Figure 28: An article was published on an academic website about educational resources from a large French region with about 33 000 teachers

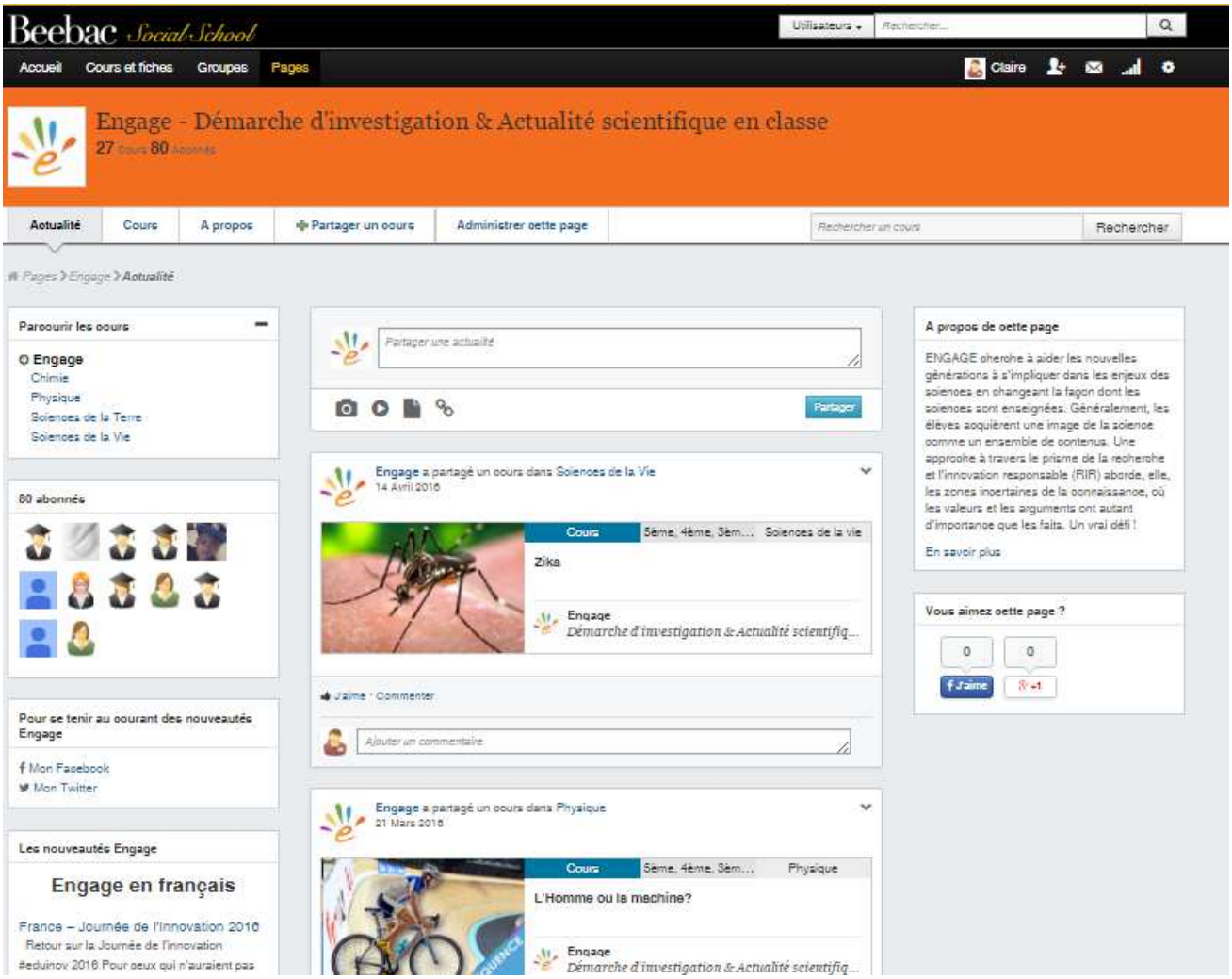


Figure 29: All the resources are published on an educational website Beebac.com with more than 200 000 users

Figure 30: Dissemination with twitter

Materials

Total number of downloads (by material) – Both French & Switzerland

- Animal testing - 55
- e-cigarettes - 83
- 2 degrees - 466
- Man or machine - 43
- Fracking - 27

Selected ADAPT dissemination highlights

We were invited to attend an Engage lesson presented by the Paris Montagne Association for children during the holidays. We could interview the organizer, the children and create a blog article about this sequence : http://www.engagingscience.eu/fr/2015/11/10/france-crise-de-cacao-a-paris-montagne/

As a success story it is also worth highlighting that Engage was selected as one of the fifty most innovative school project by the journal 'les cahiers pédagogiques'.

Way forward

For MATERIALS:

- Newsletter every month sent to all the users to present the new resources and the news of the project
- Use of social media (Facebook and Twitter) to promote resources
- New banners on the knowledge hub
- A second large mail dissemination is planned for the beginning of the summer
- Participating in innovative teacher events to present the resources
- Publication of the resources on other website (for example : http://www.beebac.com/topics/engage: 80 subscribers)

For ONLINE COURSE:

- Change of platform to simplify the access
- Social media and newsletter communication

For COMMUNITY:

- Creation of blog articles where the teachers are asked to send comments or precisions
- Encourage comments by promoting comment in the newsletter.

Romania

Dissemination activities performed (October 2015 – April 2016)

Please fill in this grid: Remember this is not the same as training workshops. Here you can put any online or face-to-face event or networking action aiming to disseminate ENGAGE ADAPT materials.

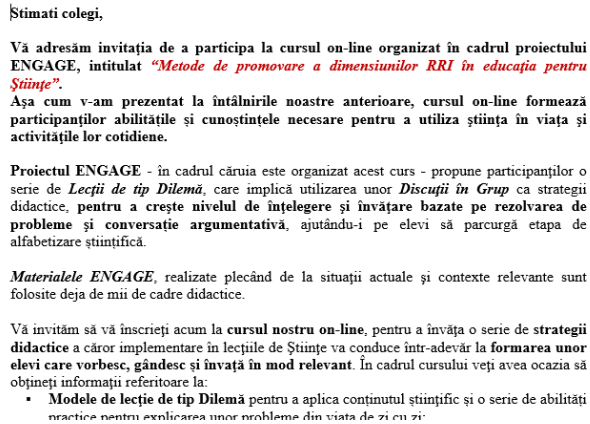
Status (done/ planned)	Date	Activity title	Tools used (URLs of web sites, blogs or other means)	Activity disse-minated?	Estimated number of people reached
Done	13.09.2015	Presentation: The ENGAGE Project - A Facilitator Context for Promoting Responsible Research and Innovation in Science Lessons – in the frame of 6th International Conference LUMEN, Chisinau, Republic of Moldavia, NASHS 2015	Oral presentation about ENGAGE project and materials Presenting the content of the Romanian website of ENGAGE project	Materials, MOOC	40
Done	13.11.2015	Workshop: “Bune practici educationale in domeniul Stiintelor, cu accent pe exploatarea dimensiunilor Cercetarii si Inovarii Responsabile (RRI)” in the frame of the 7th International Conference LUMEN MEPDEV 2015	Oral presentation about ENGAGE project and materials Presenting the content of the Romanian website of ENGAGE project	Materials, MOOC	60

Done	13.11.2015	Presentation: "EngagingScience.eu Knowledge Hub to Equip the Next Generation for Active Engagement in Science" in the frame of the 7th International Conference LUMEN MEPDEV 2015	Oral presentation about ENGAGE project and ENGAGE Knowledge Hub Presenting the content of the Romanian website of ENGAGE project	Knowledge Hub, Materials, MOOC	60
Done	13.11.2015	Presentation: "Reflective Analysis on Using "Dilemma lessons" in Science" in the frame of the 7th International Conference LUMEN MEPDEV 2015	Oral presentation about ENGAGE project and ENGAGE Materials Presenting the content of the Romanian website of ENGAGE project	Materials, MOOC	60
Done	25.11.2015	Meeting with Chemistry Teachers at Carrabella National College Targoviste	Presenting ENGAGE project to in-service teachers. Pilot implementation of: Big bag ban material to the 11th grade. Discussion with in-service teachers related to the dilemma lessons and discussion tools.	Materials, CoP	27
Done	16.04.2016	Workshop: Responsible Research and Innovation in the Educational Practice – Challenges and Perspectives in the frame of World LUMEN Congress, 12-17 April, Iasi, Romania	Oral presentation about ENGAGE project and materials Presenting the content of the Romanian website of ENGAGE project	Materials, MOOC	20
Done	16.04.2016	Oral presentation "Teachers' Feedback Expressed in a Training Course Organized in a MOOC Environment" in the	Oral presentation about ENGAGE project and materials developed in the frame of the project	Materials, MOOC	30

		frame of World LUMEN Congress, 12-17 April, Iasi, Romania			

Dissemination screenshots

In the following figures two screenshots for promoting the Romanian ENGAGE on-line course entitled *"Metode de promovare a dimensiunilor RRI în educaţia pentru Ştiinţe" ("Methods of promoting RRI dimensions in Science education")* and the ENGAGE materials on the regional website of Physics and Chemistry Teachers (http://fizchim.xhost.ro/Anunturi.htm) are presented. Based on this announce a number of 57 Science teachers submit their request to participate to the 1st edition of the on-line course and get information about the possibility to use for free ENGAGE materials and implement on their daily lessons.


Stimati colegi,

Vă adresăm invitația de a participa la cursul on-line organizat în cadrul proiectului ENGAGE, intitulat *"Metode de promovare a dimensiunilor RRI în educația pentru Științe"*.
Așa cum v-am prezentat la întâlnirile noastre anterioare, cursul on-line formează participanților abilitățile și cunoștințele necesare pentru a utiliza știința în viața și activitățile lor cotidiene.

Proiectul ENGAGE - în cadrul căruia este organizat acest curs - propune participanților o serie de ***Lecții de tip Dilemă***, care implică utilizarea unor ***Discuții în Grup*** ca strategii didactice, **pentru a crește nivelul de înțelegere și învățare bazate pe rezolvarea de probleme și conversație argumentativă**, ajutându-i pe elevi să parcurgă etapa de alfabetizare științifică.

Materialele ENGAGE, realizate plecând de la situații actuale și contexte relevante sunt folosite deja de mii de cadre didactice.

Vă invităm să vă înscrieți acum la **cursul nostru on-line**, pentru a învăța o serie de **strategii didactice** a căror implementare în lecțiile de Științe va conduce într-adevăr la **formarea unor elevi care vorbesc, gândesc și învață în mod relevant**. În cadrul cursului veți avea ocazia să obțineți informații referitoare la:

- **Modele de lecție de tip Dilemă** pentru a aplica conținutul științific și o serie de abilități practice pentru explicarea unor probleme din viața de zi cu zi;

Concerning the Romanian on-line course, it was carried out for seven weeks (November, 2nd – December, 19th, 2015) and comprised two stages (ADOPT and ADAPT) of the three-stage path, towards achieving expertise related to RRI (3 stage model: Adopt-Adapt-Transform). In the second part of the on-line course activities the ADAPT materials were promoted to the level of participants and the philosophy of ENGAGE materials was explained and discussed.

Materials

- Animal testing - 123
- e-cigarettes 177
- 2 degrees 41
- Man or machine? -
- Fracking -

Selected ADAPT dissemination highlights

On September 2015 we promoted the ENGAGE project activities and materials in the frame of the annual meeting of the Science Teachers from Dambovita county and proposed to teachers the possibility to develop the next meetings in Valahia University of Targoviste where to promote new teaching methods in relation with ENGAGE materials and develop the ENGAGE community to the level of Sciences teachers from Dambovita county. The UVT Team proceed to send newsletters and e-mail messages to about 1500 in-service Science teachers from Romania involved in the networks created in the frame of previous national/international projects developed by teaching staff of Valahia University of Targoviste.

During November month we gave ideas and helped the teachers to implement some of ENGAGE materials. One of the Chemistry teachers from Dambovita County came with idea to make an open lesson, and invite the other Chemistry teachers from the county in order to explain better to their colleagues the philosophy of ENGAGE materials. With this occasion UVT team presented also the future activities organised in the frame of ENGAGE project. The topic chosen for the open lesson was "Big bag ban" and the activities were performed with 25 students of 10th grade from National College "Constantin Carabella" Targoviste. A number of 26 Chemistry teachers from other high schools/national colleges were participated to the open lesson and at the end of it were involved in the discussions and reflections based on the activity.

The 1st edition of the ADOPT-ADAPT on-line course was promoted by Romanian team starting with 16th of September, by advertising the course to the annual meeting of Science teachers organized by School Inspectorate of Dambovita County. Then, in order to promote the course to the level of teachers from other counties, the on-line course was advertised by posting announce of the course on the regional website of Physics and Chemistry Teachers (http://fizchim.xhost.ro/Anunturi.htm).

Way forward

MATERIALS:

We are struggling to meet the target group of ADOPT and ADAPT users. We have undertaken the following actions:

- Setting up as a specific task the downloading of at least one ADOPT material related to Dillema lessons by all the on-line course participants
- Introducing the task to "Register and become an ADAPT user" before going further to the ADAPT part of the Romanian on-line course activities.
- Sending e-mails to the Science teachers concerning the new materials.
- Announcing the new edition of the on-line course on the Romanian website.
- Presentation of ENGAGE website at teacher training events and conferences.

For COMMUNITY:

- Promoting the new edition of the on-line course on the Romanian website and at different events/conferences where Science teachers/educators were involved.
- Sending newsletters to the Science teachers' community in order to promote the ENGAGE materials and to develop the Romanian ENGAGE community.

ONLINE COURSE:

- VUT organised the first edition of the on-line course entitled *"Metode de promovare a dimensiunilor RRI în educaţia pentru Ştiinţe" ("Methods of promoting RRI dimensions in Science education")* on November, 2nd – December, 19th, 2015. The course was carried out for seven weeks and comprised two stages (ADOPT and ADAPT) of the three-stage path, towards achieving expertise related to RRI (3 stage model: Adopt-Adapt-Transform). A number of 44 Science Teachers finished the on-line course.
- The second edition of the on-line course started on 18th of April 2016 and will end on June 2016. About 105 teachers registered to this edition of the course.

COMMUNITY:

We are trying to develop the ENGAGE community in Romania by sending newsletters to a big number of Science teachers, to organize dissemination events to promote the ENGAGE materials, to contact the inspectors/Science educators from different counties of Romania to help us to promote and disseminate the ENGAGE materials, workshops and on-line courses and to involve our mentors in discussing with the new coming teachers in the ENGAGE community.

Israel

Dissemination activities performed

Status (done/ planned)	Date	Activity title	Tools used (URLs of web sites, blogs or other means)	Activity disseminated? Materials / CoP / MOOC (select)	Estimated number of people reached and level of involvement
Done	Nov 2015		Face to Face meeting	Materials, presenting an activity to teachers	25
On going	May 2016	MOOC	Edx + UNICO for synchronous meeting	MOOC	7
On going		Bi-weekly email sent	Mail		All users – 648 subscribers, among them – 38 adaters
Planned	July 2016	MOOC	Moodle + UNICO for synchronous meeting	Summer MOOC	25

Planned	June 2016	Man or Machine	Publishing an article in teachers magazine	Published paper	About 300
Planned	June 2016	ENGAGE and RRI	Publishing an article in chemistry teachers magazine	Published paper	About 600

Materials

- Animal testing – 26 downloads
- e-cigarettes – 23 downloads
- 2 degrees – 45 downloads
- Man or machine? - 35 downloads
- Fracking – 28 downloads

Way forward

Personal emails and phone calls are more common than public publishing on the website. This is how mentors work with some teachers, we had good experience in doing some transform pilot activities all based on ADOPT materials as this was the choice of teachers/students.

Spain

Dissemination activities performed (October 2015 – April 2016)

Date	Activity title	Tools used (URLs of web sites, blogs or other means)	Activity disseminated?	Estimated number of people reached
11-14/03/2015	Week of Science (Madrid)	3 face-to-face demonstration of ENGAGE materials with science teachers	All	20
16/04/2015	Scientix networking event (Barcelona)	1 face-to-face meeting with representatives from other STEM projects in Europe	All	10
07/05/2015	Science Fair (Seville)	Stand at a STEM projects fair	All	150

29/05/2015	Scientific weekend at the science museum (Madrid)	6 face-to-face demonstration of ENGAGE materials to science teachers and other visitors	All	60
22/10/2015	Physics and Chemistry teacher symposium (Barcelona)	1 oral presentation about ENGAGE	All	100
25/11/2015	Symposium on teaching with socio-scientific issues (Barcelona)	1 oral presentation about ENGAGE	All	50
10/12/2015	eTwinning network of STEM teachers (online)	1 videoconference about ENGAGE (expert talk)	All	30
09/03/2016	"Science room" at education fair (Barcelona)	Handing in ENGAGE leaflets to teachers	All	40
12/04/2016	Science teachers' conference (Madrid)	1 oral presentation about ENGAGE	All	50 (planned)

Dissemination screenshots

Figure 31: The link to the ADAPT material "e-cigarretes" published in tiching.com, a teacher network and repository of educational resources with more than 250.000 users.

Ms. Silvia Alcaraz- Dominguez participated in the eTwinning network of STEM teachers expert talk on December 10th, 2015. The talk was recorded and it is available at https://eun.webex.com/eun/lsr.php?RCID=e8cdc5675ce1dedb1b2f7a4dc98f6a91.

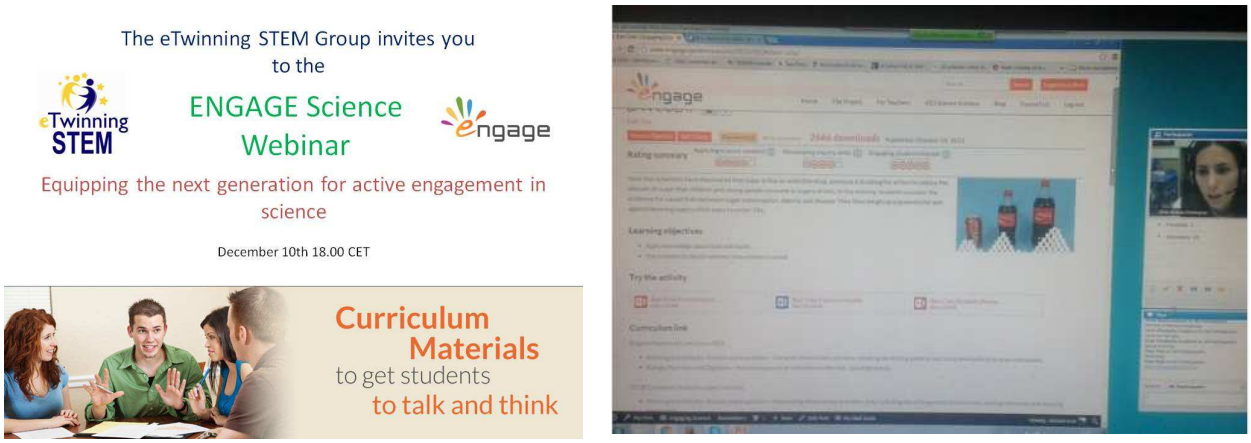


Figure 32: Advertisement for ENGAGE talk for the eTwinning STEM teachers group (left) and screenshot of the talk (right)

Figure 33: Banner of ENGAGE at a science teaching magazine

Figure 34: Disseminating ENGAGE via teacher blogs (left) and institutional educational portals (right)

Materials

Total number of downloads by ADAPT material:

- Animal testing → 198
- e-cigarettes → 127

- 2 degrees → 140
- Man or machine? → 71
- To frack or not? → 63

Way forward

For MATERIALS:

We need to work to meet the target on ADOPT and ADAPT users. We have undertaken the following actions:

- Registering and becoming an ADAPT user has been put as a pre-task for the online course
- On week 2 of the course teachers are requested to download ADOPT materials and on week 4 of the online course teachers are requested to become ADAPT users
- New banners on the Knowledge Hub
- Advertisements on online teachers' journals
- Tweets about new materials and comments
- Presentation of ENGAGE website at teacher training events and conferences

For COMMUNITY:

We send reminders to our mentors on a regular basis so that they publish comments and foster discussion.

Norway

Dissemination activities performed (October 2015 – April 2016)

Date	Activity title	Tools used (URLs of web sites, blogs or other means)	Activity disseminated?	Estimated number of people reached
March 2016	Information from the ENGAGE project	Email	Materials and MOOC	All users, a little more than 300, We got some answers regarding the MOOC, so someone read it☺

March 2016	Disemination through Naturfag.no	The major Norwegian web page for science teachers, naturfag.no	Materials	Very many possible users – this is our major site for referrals from other sites! (3x more than google)
April 6th 2016	Session on science teacher conference	Presentation of ENGAGE and discussions about dilemmas and group discussions	Materials and MOOC	Around 50 participants, high level of participation and engagement. We even had 7 teachers signing up for this or the next Presentation of ENGAGE and discussions about dilemmas and group discussions MOOC
April 26th 2016	Specific presentation of the ADAPT materials and questions to teachers	On the major Facebook site for science teachers	Materials (we have also used this site for disseminating the MOOC and more general dissemination of materials	Approximately 1900 members. No comments to my post, but 7 likes, increased visits to the ADAPT pages, new ADAPT users and also download of one ADAPT material
May/June 2016	Advertisement of course	Our university college's homepage and on the major national MOOC page; mooc.no	MOOC ADOPT + ADAPT	Many possible users…

Dissemination screenshots

Figure 35: Facebook post about ENGAGE

Selected ADAPT dissemination highlights

We have just started the ADAPT part of the MOOC now, and two of our teachers have entered ADAPT so far. Also, we have not gotten any comments to the materials, so we really don't know what the teachers think of the ADAPT materials yet. One on our MOOC teachers, however, liked the ADOPT-material so much after trying it out she and her colleague had decided to put it on the lesson plan for the autumn already.

We had two 45 minutes sessions on ENGAGE (Presentation of ENGAGE, materials and MOOC and discussions about dilemmas and group discussions) in a local teacher conference, and the teachers were very engaged. 7 teachers signed up for this or the next MOOC.

Materials

- Animal testing -> 13
- e-cigarettes -> 14
- 2 degrees -> 13
- Man or machine? -> -
- Fracking -> 4

Way forward

MATERIALS

We are still trying to disseminating the ADAPT materials broadly, but also expect more downloads as our teachers progress through our MOOC…

ONLINE COURSE

We opened the ADAPT part of our MOOC this week, and two of our teachers have already promoted themselves to Adapters and have started downloading one or more materials. We have also advertised for the MOOC on the overview of courses offered by our university college, and also on the major national web site for registering to MOOCs, MOOC.no.

COMMUNITY

First we need some teachers to interact with! We try to encourage our teachers to comment on the ADAPT materials, and as soon as they do, we (and our mentor) will answer… Again, we hope for improvement as the teachers progress into ADAPT.

Switzerland

Dissemination activities performed (October 2015 – April 2016)

Status (done/ planned)	Date	Activity title	Activity disseminated?	Estimated number of people reached
done	3.10.15 19.11.16 5h	f2f CPD workshop	Materials, CoP	5 from Fribourg
done	7.10.15 2.12.15 5h	f2f CPD workshop	Materials, CoP	15 from valais
done	5.11.15 1.5h	f2f CPD workshop	Materials	4 (from Finland, Netherlands and Israel)

done	29.1.16	Tony Sherborne opening conference Society for science didactics Switzerland	All	about 200 science didacticiens from all over Switzerland listened to the conference
done	2.11- 11.12.16	Online course	Online	4 teachers registered, 2 completed the course (from Fribourg)
done	7.3.16 3h	f2f high school pre-service workshop	Materials, CoP	9 from
done	8.3.16 3h	f2f secondary pre-service workshop	Materials, CoP	30 from Berne, Neuchâtel, Jura
done	8.4.16 30’	Présentation of the Engage project	Materials, CoP	50 preservice teachers for secondary and high school in Lausanne (canton of Vaud)
done	12.4.16	Engage Stand in CPD evening for science teachers in Valais	Materials, publicity for workshop in the autumn	30 teachers from valais have seen the stand, I could speak personally with about 6 teachers.
done	13.4.16 2h	f2f adult workshop	Materials, CoP	7 in the context of a university diploma on sustainable development
planned	11.7.16	f2f adopt-adapt-transform workshop	Materials, CoP	10? from Fribourg
planned	autumn ‘16 6h	f2f adopt-adapt-transform workshop	Materials, CoP	15? from Valais
planned	2.11.16 7.12.16	f2f adopt-adapt-transform workshop	Materials, CoP	10? from Berne-Neuchâtel-Jura

	6h			
planned	31.10- 9.12.16 (6 weeks)	online course adopt-adapt-transform	Materials, CoP, online	10? from french speaking Switzerland

Selected ADAPT dissemination highlights

Workshops and public presentations are being the best way to disseminate the ENGAGE materials in Switzerland. Through the different events listed here above we could inform many teachers and teacher trainers about the Engage approach. In general, we asked the teachers to write comments on our website after the workshops in order to foster the community of practice.

Tony Sherborne, principal coordinator of the project, was invited to the DiNat meeting in Fribourg, on January 29th 2016. DiNat is the swiss society for experts in science didactics. He gave the opening conference and spoke about Engage in the context of the topic of the congress: the place of economy in science and geography teaching.

We could organized the events listed above with the help of teacher educators or trainers or coordinators for CPD. All these people gave a positive feed-back about the ENGAGE materials, namely:

- In Lausanne, Sveva G., used herself the "Ebola" and "Text neck" activities and said "les élèves adorent", which means "students love it". She invited me to give a 30 min presentation of Engage at the HEP Lausanne, where she works, on April 8th 2016.
- In Bienne, at the HEP Bejune, where future teachers are prepared for the regions of Bern (french speaking part), Jura and Neuchâtel, Gilles B., who is a teacher trainer, was very happy about the Engage workshop, which gave his students the opportunity to discover and test our innovative way to approach science through dilemmas and group discussion, aiming the different RRI skills.
- In Valais, Adeline B., has helped us to organize a workshop last autumn with 15 participants. Last month, she invited us to an evening event where science teachers could enrich their practice. There were several stands and Engage was among them. This gave us the possibility to inform about the next coming workshop in Valais, this autumn. I met several teachers that have been using the ENGAGE materials already.
- In Fribourg, I can collaborate with Raphaël S., who coordinates CPD and program issues. He has personally used "Ebola", "Ban cola" and "Invasion!". Seven teachers have already benefited from a workshop and an online course in Fribourg.

Way forward

In order to continue progressing in the coming months, we have planned three additional workshops in Fribourg, Bienne and Valais and an online course. To prepare this courses, we are doing our best to recruit a

number of teachers (ideally 10, at least 5) to carry out a research, where we want to analyse the impact of the use of the ENGAGE materials on their practice.

Lithuania

Dissemination activities performed (October 2015 – April 2016)

Status (done/ planned)	Date	Activity title	Tools used (URLs of web sites, blogs or other means)	Activity disseminated?	Estimated number of people reached
Done	8/10/2015	Science teacher's conference (Vilnius)	1 oral presentation about ENGAGE	All	50
Done	16/10/2015	Workshop for science teachers (Tauragė)	Face-to-face demonstration of ENGAGE materials with science teachers	Materials	30
Done	26/10/2015	Workshop for science teachers (Jonava)	Face-to-face demonstration of ENGAGE materials with science teachers	Materials	30
Done	29/10/2015	Workshop for science teachers (Tauragė)	Face-to-face demonstration of ENGAGE materials with science teachers	Materials	30
Done	7/11/2015	Exhibition "School 2015" (Vilnius)	1 oral presentation about ENGAGE	All	15
Done	05/01/2016	Workshop for science teachers (Plungė)	Face-to-face demonstration of ENGAGE materials with	Materials	30

			science teachers		
Done	23/02/2016	Workshop for science teachers (Vilnius)	Face-to-face demonstration of ENGAGE materials with science teachers	Materials	30
Done	21/03/2016	Workshop for science teachers (Molėtai)	Face-to-face demonstration of ENGAGE materials with science teachers	Materials	25
Done	11/04/2016	Workshop for science teachers (Utena)	Face-to-face demonstration of ENGAGE materials with science teachers	Materials	25

Dissemination screenshots

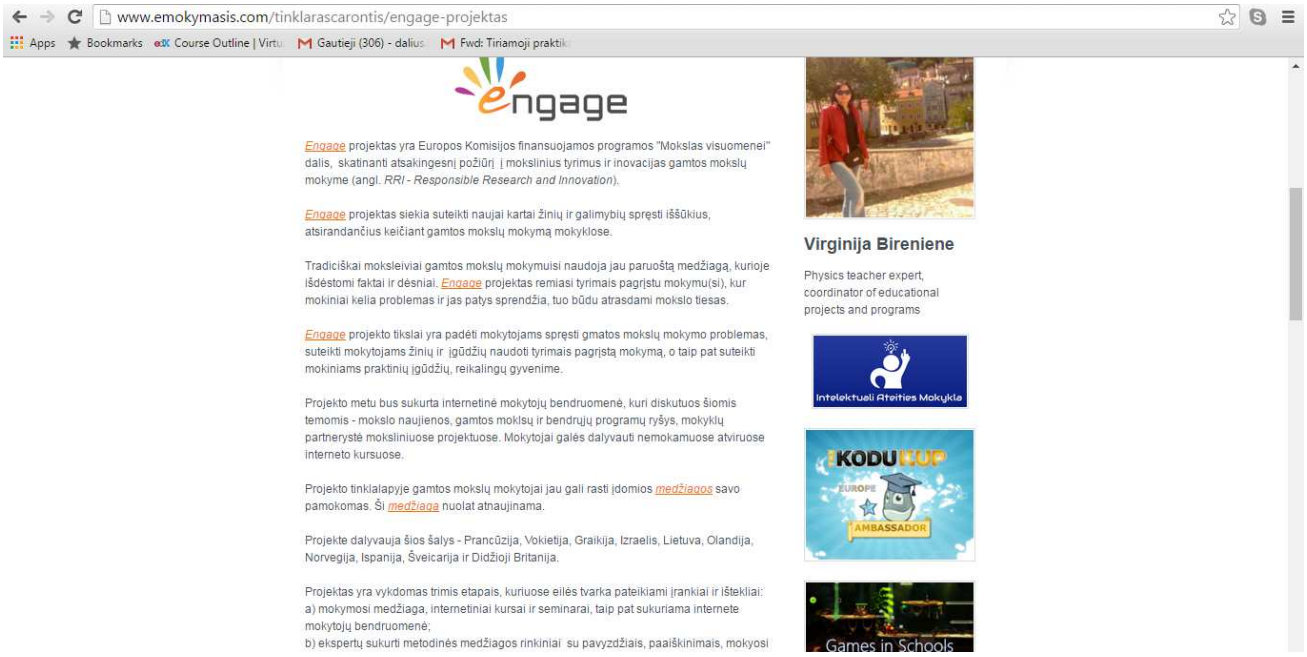


Figure 36: Information about the ENGAGE project on the webpage E-learning (available from http://www.emokymasis.com/tinklarascarontis/engage-projektas)

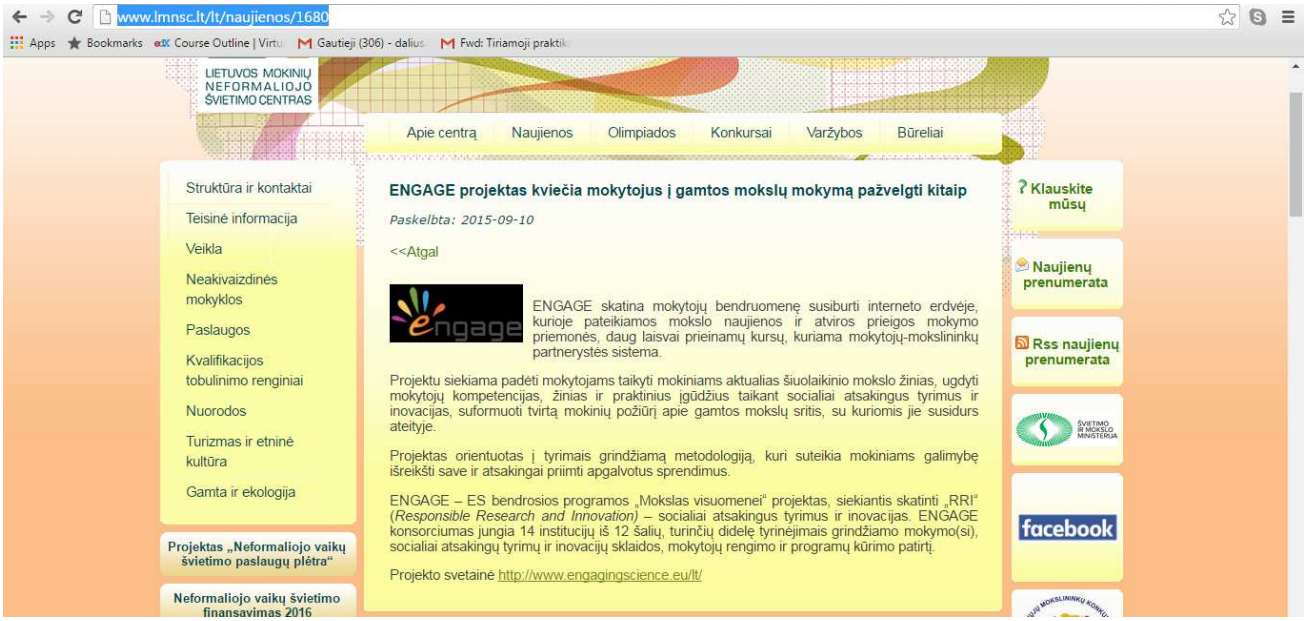


Figure 37: The link to the Lithuanian ENGAGE site was included into the webpage of Lithuanian Centre of Non-formal Youth Education (available from http://www.lmnsc.lt/lt/naujienos/1680).

Figure 38: Information about the MOOC in Lithuania was announced in the webpage of Education Development Centre which is the biggest institution affiliate to the Ministry of Education and Science of the Republic of Lithuania. (Available from http://www.upc.smm.lt

Figure 39: The link to the Lithuanian ENGAGE site and its teaching materials was included into the webpage of Biology teachers group of Vilnius district (available from http://biologai.jimdo.com/)

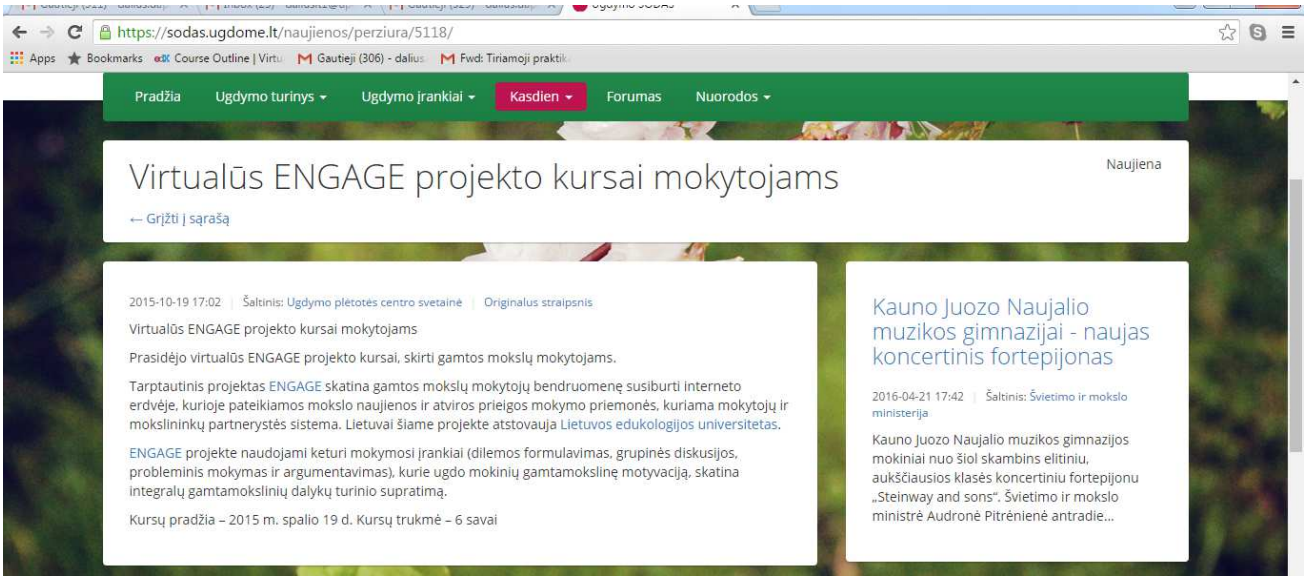


Figure 40: Information about the MOOC in the website dedicated for Lithuanian teachers (available from https://sodas.ugdome.lt/naujienos/perziura/5118/)

Cyprus

Dissemination activities performed (October 2015 – April 2016)

Status (done/ planned)	Date	Activity title	Tools used (URLs of web sites, blogs or other means)	Activity disseminated?	Estimated number of people reached
Done	5/10/15	Presenting examples of socio-scientific issues materials	Face to face presentation in an MA class at the University of Nicosia	Examples of materials	32 in-service teachers
Done	20/10/15	How to implement SSI activities in the classroom	Face to face presentation at a school in Nicosia	Examples of materials	12 in-service teachers
done	9/11/15	What is RRI	Face to face presentation with pre-service teachers at the University of Cyprus	Examples of materials	104 pre-service teachers
done	23/11/15	SSI and the Physics curriculum in Cyprus	Face to face presentation with physics in-service teachers at the Cyprus Pedagogical Institute.	Examples of materials	15 in-service teachers
Done	5/12/15	Research trends and curriculum development in Cyprus and Europe	Face to face presentation at a conference organized by the Ministry of Education of Cyprus	Examples of materials	More than 100 teachers and policy makers across Cyprus
Done	5/1/16	Engage Research Project at UNic	Presentation in the University's research newsletter explaining the purposes of Engage	Examples of materials and mooc	More than 300 academics and MA students
Done	19/1	Engage Research Project and SSI	Presentation of the project to in-service teachers in Limassol	Examples of materials and mooc	26 science teachers

Done	10/2	Teaching Materials for Science	Newsletter/email distributed to our contacts	Examples of materials and advertising the mooc	More than 80 in-service teachers
Done	15/3	Materials to teach SSI	Presentation to pre-service teachers	Examples of materials and advertising the mooc	12 pre-service teachers
Done	18/3	Materials to teach SSI	On-line presentation to in-service teachers that are part of an MA program at UNic	Examples of materials and advertising the mooc	21 in-service teachers
Done	14/4	How to implement SSI activities in the classroom	Face to face presentation at a school in Nicosia	Examples of materials	9 in-service teachers

Dissemination screenshots

Selected dissemination highlights

I recently received an email from a teacher that participated in one of our presentations saying: “I would like to thank you for giving me the opportunity to see the Engage materials and a new approach to teaching science” (Andreas)

The presentation that we gave for the Ministry of Education (5/12/15) was inspiring since we had the chance to start a discussion between teachers, policy makers and curriculum developers. The curriculum developers identified in the materials that we presented aspects that they want to include in the new curriculum materials that they are developing.

Figure 41: Presentation to policy makers, teachers and curriculum developers during the Ministry of Education Conference

Pre-service teachers in our classes engaged in designing SSI lessons after they familiarized with the ENGAGE materials. One of the groups decided to design a lesson about the bees (What will happen if all the bees die) and they incorporate ideas from the ENGAGE lessons.

Figure 42: models of the bee hive and the bee that the pre-service teachers were constructing as part of their lesson.