Periodic Report Number 1: Mid -Term Review Report
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Name, title and organisation of Co-ordinator and Scientific Lead: Tony Sherborne (SHU)
Tel: 0114 225 4870
E-mail: t.sherborne@shu.ac.uk
Project website: www.engagingscience.eu

THE ENGAGE CONSORTIUM

Centre for Science Education – Sheffield Hallam University (Coordinator)	UK
Knowledge Media Institute – The Open University	UK
Institute of Applied and Computational Mathematics, Foundation for Research and Technology	Greece
Innovation in Learning Institute	Germany
eXact learning Solutions	Italy
Traces	France
Valahia University Targoviste	Romania
Weizmann Institute	Israel
Universitat de Barcelona	Spain
Buskerud and Vestfold University College	Norway
Biotechnology & society department, Delft University of Technology	Netherlands
School of High Pedagogy of Freiburg	Switzerland
Lithuanian University of Educational Sciences	Lithuania
Department of Education, University of Nicosia	Cyprus

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1. DECLARATION

I, as scientific representative of the coordinator of this project and in line with the obligations as stated in Article II.2.3 of the Grant Agreement declare that:

- The attached periodic report represents an accurate description of the work carried out in this project for this reporting period;
- The project ☑ has achieved most of its objectives and technical goals for the period with relatively minor deviations.
- The public website, if applicable ☑ is up to date
- To my best knowledge, the financial statements which are being submitted as part of this report are in line with the actual work carried out and are consistent with the report on the resources used for the project (section 3.4) and if applicable with the certificate on financial statement.
- All beneficiaries, in particular non-profit public bodies, secondary and higher education establishments, research organisations and SMEs, have declared to have verified their legal status. Any changes have been reported under section 3.2.3 (Project Management) in accordance with Article II.3.f of the Grant Agreement.

Name of scientific representative of the Coordinator: **Tony Sherborne** Date: 31/10/2015

1. PUBLISHABLE SUMMARY

The project

Shifting school science towards RRI

ENGAGE aims to give the next generation of students the knowledge, skills and attitudes to deal with socio-scientific issues in their lives, and develop informed opinions on emerging science and technology. ENGAGE's goal is to embed Responsible Research and Innovation (RRI) within the science curriculum and change the way science is taught. Through a set of innovative strategies, we will shift the emphasis from transmitting a body of scientific knowledge towards applying science to issues that matter to students. Teachers will develop their understanding of RRI and how to teach RRI skills to students using authentic activities to simulate how citizens conduct inquiries. ENGAGE operates on a major scale, expecting to engage 2 million students and their 12,000 science teachers across 11 countries: UK. Greece, Germany, France, Romania, Israel, Spain, Norway, Switzerland, Lithuania, and Cyprus. We will spread its legacy further, to other countries around the world.

State of the art innovation

The shifts required for teaching with issues are complex: research to date has not illuminated any simple path. ENGAGE is a multi-pronged approach to creating a series of positive conditions for change. It is based on best practice and the long expertise of the consortium in curriculum design and professional learning. At the same time, ENGAGE is focused on making change easier with concrete actions, and more rewarding by generating visible interest, talking and thinking in students.

We have created a pathway of 'baby steps' to change. The first step, called Adopt, has a very low entry point so that we achieve take-up up teachers on a massive scale. They use our state-of-art materials which take science issues from the news, and turn these into fully resourced, curriculum-linked lessons. We know a teacher's first classroom experiences with innovation is pivotal. With ENGAGE teachers will see positive outcomes on their students from the beginning, to provide the motivation to continue the experiment rather than revert to the status quo. Two other ENGAGE strategies will capitalise on teachers' curiosity to find out how and why the lessons work so well. Our website aims to become an online community which stimulates reflective dialogue and interaction with knowledgeable mentors. Our online courses package up the new pedagogy and principles into interactive learning experiences, which are supplemented by face-to-face workshops. Once teachers are confident with Adopt, they progress to the next stage, Adapt, where they learn an expert's toolkit of examples, explanations and activities to help students learn RRI. We conceived the third step, called Transform, as an experiment in 'Open Schooling' for a small proportion of teachers who want to make RRI a major focus of a science topic. We provide the support to help them plan an issue-based project where they and their students can be mentored by practising scientists or science journalists, to learn RRI directly through experience.

Results so far

Rigorous curriculum and professional development

To get RRI used in schools, we realized we needed to define a set of goals for what we will teach students and teachers through ENGAGE's strategies. We call this our 'RRI curriculum', and critically, we designed it to

to integrate with national curricula and assessment, to maximize the chances of teacher adoption. It is a set of 10 processes that are fundamental for students to master for conducting issue-based inquiries: define questions, analyse patterns, draw conclusions, communicate ideas, justify opinions, critique claims, interrogate sources, use ethics, estimate risks, and examine consequences. We also realized the need to devise a concrete set of RRI pedagogical practices, to make them easy and compelling enough for any teacher to learn. We have create 3 innovative 'Tools', which describe the how our lessons and projects are structured, Dilemma Lessons, Problem-solving Sequences, and Scenario-based Topics. A further 3 Tools explain the rationale for the RRI teaching strategies we recommend: Group Discussions, Class Conversations, and Performance Assessment. The 6 Tools form the basis of a coherent framework for ENGAGE's professional development programme of online courses and workshops.

6,000 teachers have embarked on ENGAGE

Since we launched our website in June 2015, 6000 teachers have signed up, across the 11 countries. Some partners, Lithuania, Israel and UK, substantially exceeded already ambitious targets for engaging teachers. We have published 22 materials so far, and the presentation materials, and the pedagogical teachers guide have together been downloaded more than 100,000 times. We estimate that 750, 000 students have been exposed to the ENGAGE materials (based on 25% usage with 30 students). Almost all teacher's views about the materials posted online have supported the idea that they create positive experiences in the classroom:

"The reaction of the students was positive at all times; the highlight was to analyse a real and current scientific problem, which has no single answer. They learned to listen and understand that everyone can hold some truth" Science teacher, Spain

Innovative ADAPT materials to explicitly teach RRI processes

ENGAGE positions itself as providing high quality materials based on the best of research and state of the art practice. We based our materials on an already popular model for taking socio-scientific issues into school from 'science upd8', and then developed our own style, which we have successfully piloted. We have so far devised two kinds of materials: single lessons as a taster for using socio-scientific issues, and innovative two lesson sequences so teachers can explicitly teach the 8 skills in our RRI curriculum, using games.

Innovative workshops and online courses rolled out

We have created two online course, to enable teachers to learn our 6 Tools for RRI teaching. They are highly practical, with teachers applying the ideas by teaching RRI-based lessons and getting feedback from peers and experts. Two countries have run pilot courses so far. Our other partner countries are rolling course out in October/November 2015. Manny teachers have found the courses valuable:

"I applied the activity from the course some weeks ago. It helped students to make the difference between opinions and facts. As a department we discussed how the lesson could be expanded. The students were fascinated by the topic and came up with loads of ideas" UK science teacher

Highlights

'Ebola' is one of our most popular materials. Students weigh up the risks and benefits of volunteering for the experimental vaccine

The Association of Lithuanian Science Teachers voted ENGAGE best project of 2015, and our workshops attracted 185 teachers

The material 'Eating Insects' is very inspiring. Students love it and were improved their writing significantly (Alex, UK teacher).

Students presented their work on the 'Electric Cars' material at an international conference, at the Open University (UK)

"It makes you think what the advantages and disadvantages are of buying an electric car for the environment, and its cost" UK student

Expected impacts

We expect, based on the teacher registration numbers so far, to reach or exceed 12,000 teachers using ENGAGE, and 2 million students to be taught RRI-based lessons. We believe a proportion of the teachers will progress to the second and third stage and develop real expertise in RRI-based teaching. Then, our evaluation should find a significant shift in their practice towards more authentic, open science teaching which emphasises the applications and implications of science.

ENGAGE will leave a great deal of widely disseminated legacy content for RRI-based science teaching. Our materials, will persist on the ENGAGE portal, and be disseminated through Scientix to many other European countries. Similarly, we expect our online courses to be made available in a self-service form for teachers to take advantage of for years to come.

ENGAGE website

Visit www.engagingscience.eu for news, curriculum materials and online courses, in 11 languages.

2. PROJECT OBJECTIVES

2.1 Project Objectives for the period Jan 2014-Aug 2015

Engage has had a successful first 18 months. The consortium has a clear vision for what RRI-based science teaching should look like, and an ambitious goal to transform the practice of at least 600 of the 12000 teachers engaged as well as make a partial change in many more. We have laid rigorous foundations based on research and best practice, for our three strategies, materials, courses and community. We have already published nearly half of the 60 innovative RRI teaching materials. 6000 teachers have already starting downloading these from the website, more than half way to reaching the overall target, and their feedback is very positive. Much of the success is due to the unusually high degree of collaboration among partners, and the extent to which we are committed to achieving high quality outputs.

The project has turned out to be more complex than envisaged, both in turning our vision into concrete pedagogical strategies, and in creating the technical systems to deliver them. The combination of producing our own professional development framework, and having to setting up a new platform for online course delivery substantially delayed the roll out of our programme. The timeframe for implementing several different stages, each with their own unique programmes, also appeared over-optimistic. This has led to the time for the last TRANSFORM stage, and the projected teacher transformation, rather short. It may therefore prove difficult to detect the impact we are expect within the three years of the project. We support the proposal of our external evaluator to request an extension of several months, so that our promising innovations have more time to achieve a measureable impact on teachers and their students.

Evaluation, both internal and external, has highlighted several main areas where we need to focus more effort in the second period of the project. The first is to improve our online course content, and fix technical problems, to create a better experience for teachers which in turn will attract the higher numbers we need. Currently there is a lot of text, but not enough rich media or interactive tasks, which would be more compelling. We are now working with experts within the partner organisations to improve the production values of the courses. A second area is to speed up the recruitment, training and use of 'expert RRI teachers' whose job is to mentor beginning teachers, and encourage them to reflect and progress to later stages – which is critical if many teachers will transform their practice. A third area is we need to exert tighter project management control on completing task on time so that we do fall further behind with delivery.

Overall outputs for period

20 Dilemma Lesson Materials ☑

We reached this target by month 18, well ahead of month 30 schedule

20 Problem-solving Sequence Materials- in progress

We are on schedule to reach the target by month 30

20 sets of 'just in time' online content ☑

We have produced material on RRI teaching and have published this in teacher guides, and online courses.
100 '*expert RRI teachers* recruited as mentors – in progress

17 ENGAGE Workshops in 11 countries ☑

All partners have run first year workshops, and are planning the next

11 Online courses – in progress

Pilot workshops have been run in two countries; the remaining ones are in October-November 2015.

3. PROGRESS REPORTS

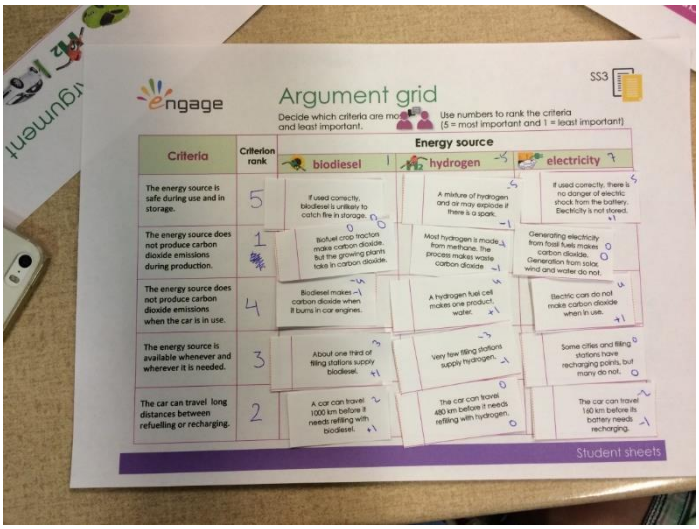
Each Work Package leader has summarised highlights and progress against the objectives for this period.

3.1 Work Package 1 - Framework

This Work Package is led by Weizmann Institute of Science (Israel). WP1's overall goal is to develop the teacher development and curriculum development models for the project, and trial some of the strategies.

WP1 produced several significant results:

- A detailed analysis of RRI usage in the school system to inform developments
- A rigorous curriculum framework for creating high quality RRI materials
- A set of piloted ADOPT materials which teachers found very engaging



We defined an RRI curriculum which explicitly teaches skills like argumentation, vital for engaging with socio-scientific issues

Objective 1: Specify ENGAGE's RRI approach and interventions ☑

T1.1 RRI Curriculum Analysis:

To successfully embed RRI in school science, we knew we would have to take advantage of curriculum opportunities and overcome cultural obstacles within each country. So, early in the project, we carried out a

detailed analysis of the existing RRI picture. This showed that the assumptions of our project strategies were broadly correct. The results were valuable for shaping the development of pilot materials and online courses, and our ADOPT dissemination strategy.

WP1 carried out a survey of all partners around six themes: **(see D1.1):** Overview of science education; Recent curriculum changes in relation to RRI; Curriculum objectives and expected outcomes in relation to RRI; For example, partners analysed their national curricula in detail to identify which skills explicitly mentioned matched RRI processes, and which topics matched socio-scientific issues we expected to cover. WP3 used the resulting grid to choose topical issues and RRI skill focusses that would be relevant to the maximum number of partners.

Objective 2 – Extra – Produce a rigorous RRI curriculum framework ☑

We soon realised that, in order to create a coherent approach to teaching RRI across the project, we would have to develop our own RRI curriculum framework. This was not an explicit part of the DoW, but we decided it was essential for the project's success. We took the broad areas of RRI listed in the DoW, prioritised the processes which matched best with partners' curricula, and devised a set of goals for 10 RRI processes. We focussed on a small number because we wanted students to effectively master our 'RRI curriculum' which would require several exposures to each. To inform WP1 we defined a set of preferred teaching strategies for each goals consistent with best practice and research.

ENGAGE's 10 RRI processes for engaging with socio-scientific issues

Define questions	Interrogate sources
Analyse patterns	Use ethics
Draw conclusions	Critique claims
Estimate risks	Communicate ideas
Examine consequences	Justify opinions

These 10 RRI processes have underpinned the design of materials for all three project stages:

- In ADOPT: students are introduced to RRI processes
- In ADAPT: they are explicitly taught the RRI processes
- In TRANSFORM: they combine several learned RRI processes in an independent project

Objective 3: Produce 4 exemplar 'open educative resources' ☑

T1.2 Prototype OER Materials
T1.4 Classroom testing and observation

Between March and July 2014, we developed six pilot materials, following the successful design principles for producing topical science used by the previous 'Science upd8' project from Sheffield Hallam University.

The six pilot ADOPT Materials:
- Car Wars, RRI area: evaluating solutions
- Three Parents, RRI area: ethics
- Grow your own body, RRI area: claims

- Ban Coke: RRI area: Cause and effect
- What does the fox say: RRI area: Writing arguments
- Attack of the Giant Viruses: RRI area: Trustworthiness

We published them on the new ENGAGE website for teachers to download, and carried out classroom testing in Norway, Cyprus and Israel, using observations, questionnaires for teachers and students and interviews with two teachers. The overall finding was that teachers and students found the socio-scientific issues and the activities highly engaging. **See D3.6 and D.9.18 p 3.**

In the UK, we piloted a marketing strategy to disseminate materials through the ENGAGE website. We learned email marketing using software and managed to achieve a high 'open rate' of more than 25%. We also tested how to persuade teachers to register on the site and managed to get more than 1000 sign ups. **See D9.18 p.4**

Objective 4: Prototype our professional development programme ☑

T1.3 Prototype Courses

In WP1 we outlined the content of an ENGAGE Workshop and the structure of an online course, and researched and chose a platform for delivery (EdX) **(see D1.2).** However, as with the curriculum materials, we realized that a much more coherent underpinning than what was described in the DoW was necessary if we were to provide a compelling and powerful programme. We decide to create a professional development framework, but this could not be completed in the first framework phase. So we moved much of this new objective into WP3, where it is described.

Resources

The resource usage table shows the planned person months over the period compared to the actual time spent per partner on WP1. This shows that most partners used the amount of time estimated on WP1. Weizmann and HiVe used significantly because of the amount of piloting of the curriculum materials.

Partner	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL
	SHU	OU	FORTH	FAU	ELS	TRACES	VUT	WEIZMAN	UB	HiVe	TU Delf	DICS	LIETUVO	Unic	
Planned for months 1-18	2.5	2.5	3.5	1	0	1.5	0	4	0	2	0	0.5	0	2	19.5
Actual for months 1-18	3.2	2.2	3.5	1	0	0.5	0	2.85	0	1.39	0	0.5	0	2	17.14

3.2 Work Package 2 - Knowledge Hub

This Work Package is led by Lattanzio Learning (Italy). The goal of WP2 is to create effective platforms to deliver to teachers the three project strategies: curriculum materials, online courses and community.

WP2 produced several significant results:

- Development of a website which has high traffic and teacher registrations
- Set up of the EdX platform to run online courses

Teachers exploring the ENGAGE website in a workshop in Cyprus

Objective 1: To create ADOPT and ADAPT platforms for teachers ☑

T2.1 Platform

T2.2 Project Website

T2.5 Learning Analytics (in progress)

We quickly created the first version of the ENGAGE Project website by June 2014, ready to showcase the pilot materials and disseminate news about ENGAGE. The website has been online a year now, and had impressive numbers of visits for a new project.

	Visitor	Visit
Today:	586	4,932
Yesterday:	593	7,134
Last 7 Days (Week):	3,438	73,894
Last 30 Days (Month):	7,856	335,186
Last 365 Days (Year):	41,746	967,401
Total:	41,746	967,401

The ENGAGE website has had nearly 1,000,000 visits during the last year.

We developed the website by customizing WordPress, the open-source content publishing platform used for blogging. We chose it to make it easy for partners to administer the content themselves. We created an attractive and simple to use interface for teachers to locate, find out about, and download materials. Once the platform was tested in English, we created a 'multisite' version in all 11 languages, and each partner started translating all the project info to disseminate to teachers. Over the following year we have added much functionality to enhance the user experience:

- Comments and replies to comments – to stimulate teacher reflection for our Community strategy
- Reminder dialogue boxes to encourage teachers to comment on materials
- Ratings for materials
- Blog to publish project news

Learning analytics

By Learning analytics we mean collecting data about teacher use of ENGAGE. We have made a start to this but have a lot further to go. First we analysed current technical solutions, and discussed analytics tools to collect qualitative and quantitative data about usage of the website, materials, and the online courses. We develop web questionnaire to collect teachers opinions before and after the course, and we have implemented a statistics package on the website so we can monitor indicators such as number of visitors, locations, number of downloads, most downloaded material and most visited lesson.

Objective 2: To build a platform for delivering ENGAGE online courses – in progress

T2.4 MOOC

We have successfully created a platform, based on industry standard software, to deliver high quality online courses. However, the process was more difficult and took longer than expected. In the DoW we had planned to use one platform to deliver both the project materials and the online courses. However, we realized early on that to deliver the functionality and experience of an online course would require a different, dedicated course platform. Setting this up, as described in the next section, was complex, and led

to long delays before we could start creating content on it. This, along with the extended time to complete our professional development framework, meant that in most countries, the first online courses did not take place during the first full academic year of the project, and instead were scheduled for the autumn term of the second.

The first step in creating our online courses was to carry out a technical survey on available platforms. From this we shortlisted the BSCW platform and EdX, and following a dedicated face-to-face meeting, we selected EdX platform. Created by Harvard and MIT, it is used by many of the world's leading universities. It has the advantage of being very customisable, to create local variations for each partner.

There were many stages involved in setting up EdX ready for our content, from preparing multiple servers for testing and development, to integrating EdX with WordPress for 'single sign on' experience, to training partners in how to use EdX to design courses. During February-April 2015 we tested EdX for the first time with 10 teachers and a sample from the course. Only 5 of them completed the course. The main reason was technical difficulties. We were able to install an improved upgraded version of EdX in May 2015, which was made ready for the first pilot ADOPT courses in July 2015.

Objective 3: Produce Transform tools to allow interaction and working with scientists - starting

T2.3 Partnership Brokering

The aim is for our website to provide the functionality to support teachers at the TRANSFORM stage where they need to find and select a relevant RRI expert scientist to mentor their project. The Partnership Brokering system is under development: we have identified and tested a WordPress plugin which allows this to be easily implemented. The system will allow us to build local directories of RRI expert scientists in each country, and search these, as well as managing the registration process for scientists and teachers.

Resources

The resource usage table shows the planned person months over the period compared to the actual time spent per partner on WP2. This shows that a few partners used more time than estimated on WP2. This is explained by the fact that the PMs were not supposed to be allocated in a linear manner, as the platform needs to be set-up at the beginning of the project. In addition is the learning curve needed in order to work with the software, which was new to many partners and requested more support than planned from the technical side.

Partner	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL
	SHU	OU	FORTH	FAU	ELS	TRACES	VUT	WEIZMAN	UB	HiVe	TU Delf	DICS	LIETUVO	UNic	
Planned for months 1-18	0	4.50	0	0	12.00	0	4.50	0	0	0	0	0	0	0	21.00
Actual for months 1-18	0.1	4.12	0	0	18.84	0	4.5	0	0	0	0	0	0	0	27.56

3.3 Work Package 3 - Resources

This Work Package is led by Sheffield Hallam University (UK). The goal of this Work Package is to develop high quality curriculum materials and online course content for the ADOPT, ADAPT, and TRANSFORM stages

WP3 produced several significant results:

- High quality Dilemma Lesson materials which integrate socio-scientific issues and science content
- Innovative ADAPT materials which explicitly teach RRI processes
- High take-up of materials by teachers in almost all countries
- Content for ADOPT and ADAPT online courses

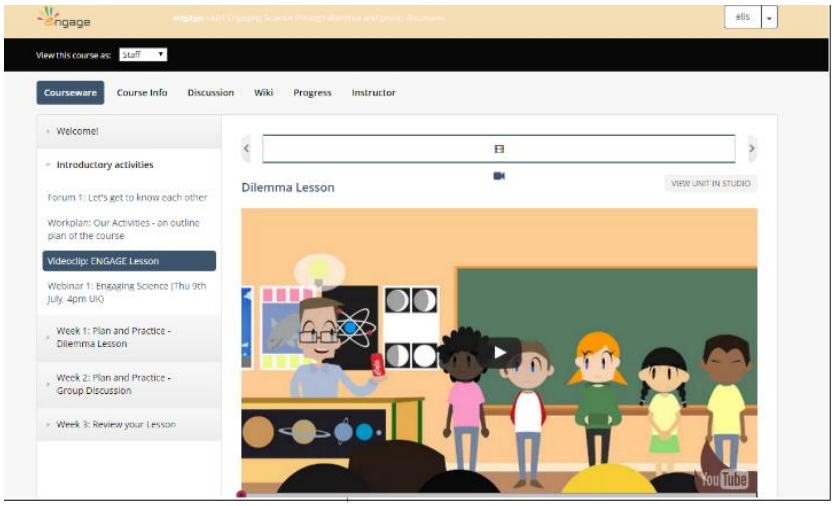


Figure: An animation on 'Dilemmas' we produced for the video library and online course

Objective 1: A Professional development framework of 6 Tools ☑

In an objective which was added to the Work Package (explained in WP1 report), we produced a rigorous professional development framework which converted the dimensions of change from a 'novice' to an 'expert' RRI teacher, into clear, concrete strategies for teachers to use in the classroom.

Our starting point was to describe 'practices: using authentic tasks, explicitly teaching RRI skills and knowledge, and using open dialogue to build students' reasoning. **See deliverable D3.5, p17.**

We knew from research that professional development is more effective when it focuses on well-defined skills rather than general practices like those above. So we turned these into six easy to use 'Tools' for teaching which became the focus of our work with teachers. The Tools were apportioned between the three stages of ENGAGE:

ADOPT Tools:
Dilemma lesson: How to structure a lesson around setting up and resolving a 'Dilemma'
Group Discussion: How to prepare students, and support them in effective group discussions

ADAPT Tools:
Problem-solving sequence: How to structure a two-lesson sequence to teach an RRI process
Class conversation: How to lead whole class discussions to develop argumentation skills
TRANSFORM Tools:
Scenario-based topic: How to turn a science topic into a real-science project
Performance assessment: How to assess student skills in RRI and applying science

The framework provides a research-based rationale for the strategies we have chosen, and has enabled all partners to provide a similar, high standard programme.

However, developing the Tools took a long time, which had knock-on effects for the subsequent stages of the project. The guiding principles, strategies, prototypes and pedagogical design for the CPD courses in WP2 (Knowledge Hub) and WP3 (Resources) have experienced set-backs as a result. The first Adopt workshops and MOOCs were originally planned for January/February 2015 but did not happen until the summer and autumn 2015.

Objective 2: Develop 'ADOPT' Dilemma lessons to maximise take-up ☑

T3.1 Process for materials development
T3.3 OER Materials
T3.4 Localisation

The concept for materials in the first, ADOPT stage, is short dilemma-led lessons taking an issue recently in the news across Europe, set up a dilemma question, and then provide a stimulating activity for students to review the science and develop an informed opinion. This lesson model was developed hand-in-hand with the two ADOPT Tools: Dilemma Lessons and Group Discussion. Through this integration, teachers using the materials teachers would develop curiosity in how and why the lessones work, and be motivated to enrol in an online course or workshop.

During April 2014-June 2015 WP3 produced and published, 20 Dilemma lessons on a broad range of topical issues which matter to students and society. They are all downloadable from the engagingscience.com websites, in 11 languages.

Death to diesel?

Communicate | Reactions

Major car manufacturers have fitted software to diesel cars to cheat exhaust emissions tests. In this activity students use their knowledge of chemical reactions to predict ...

Electronic cigarettes

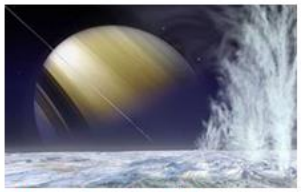
Estimate risk | Particles

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 ...

Animal testing

Breathing | Use ethics

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 ...



Life on Enceladus?

Draw conclusions | Particle model

Evidence from Cassini, a robot spacecraft, suggests that there are oceans of hot water on Saturn's icy moon, Enceladus. Might the oceans be home to alien ...

Invasion!

Consequences | Interdependence

Common ragweed, Ambrosia artemisiifolia, is an invasive plant which is spreading across Europe. Because of illness caused by its allergenic pollen and competition with crops, it's ...

Text neck

Contact forces | Devise questions

New research suggests that smart phone use is seriously damaging our necks. Looking down at an angle places great strain on the spine, and can result ...

Some of the Dilemmas published on our website

Based on the feedback we have received, the materials act as helpful exemplars for teachers unfamiliar with RRI teaching. However, in some countries where there is not a culture of using pre-prepared lessons, like Greece and Cyprus, some teachers were less keen, and want either to customise them, or improvise entirely new activities. We are enabling these different types of use. First, by delivering materials in PPT which allows teachers to make their own changes. Second, the teacher guides and the workshops and courses make clear the rationale, so teachers can make changes while keeping pedagogical principles intact.

Another unique feature of ENGAGE materials is our fast publishing. We managed to turn an idea into a published material within 4-6 weeks. The benefits is that the issues are still fresh in students' minds when they are taught in class. To achieve this we designed a development workflow, around the core WP3 team of SHU, with several stages of tightly scheduled input and consultation from other partners. We also managed to achieve localisation of the materials to meet the needs of each country. Each partner contributed information to make the context fit their context, and adapted the text during the translation process. The result is that we have high numbers of downloads in most countries.

Objective 3: Develop 'ADAPT' lesson sequences to teach RRI skills – in progress

T3.3 OER Materials

T3.4 Localisation

ENGAGE is characterised by its three stages that represent a progression of successively more RRI integration into the curriculum. ADOPT materials give practice using RRI skills in a short activity, but assume the skills and content have already been introduced. ADAPT materials are more ambitious. They allow teachers to teach RRI explicityl. For ADAPT we developed a novel two lesson sequence, centred around a game-like activity where students are introduced to the skill in a simple non-science content. They then reflect on this expereince, before using the skill to solve the science dilemma. We have developed and published 4 ADAPT sequences so far. These will be used to collect feedback from teachers, and inform the re-development of the rest.

A quiz show game, in our ADAPT material e-cigarettes, to learn what factor affect risk

Objective 4: Create online courses for ADOPT, ADAPT and TRANSFORM – in progress

T3.2 Online Courses
T1.5 Video Library (moved from WP1)

The foundation for developing the online course content was the professional development Tools described earlier. We then created courses around these, of short duration – around 6 hours each. They are focused on teachers interacting with the content of the Tools, trying them out in school using our materials, reflecting on their use and discussing changes in practice with other teachers and the course facilitator.

To date we have developed the first two ADOPT, and ADAPT course. We have piloted them in two countries, and are in the process of rolling them out across the consortium - in October and November 2015. However, as already explained the process took a lot longer than anticipated, so the rollout has been delayed by several months.

Video is often a central part of online training courses. ENGAGE planned to produce a 'video library' explaining RRI pedagogies in our Tools and showing them in use. After much discussion, the consortium decided that animations would be more suitable for localisation than videos made in one language. We have so far finished an animation on 'Dilemma Lessons' and a second one on 'Group Discussions' is in production at the transcript stage. We do not have sufficient budget to make animations on all 6 Tools, so we will chose and curate from existing video sources.

The video library task was original part of WP1. However, we could not resolve legal and ethical difficulties in many countries with making videos of children in classrooms, and we also felt that videos made in another language would not be compelling for teachers to watch. Thus we changed our strategy, and went for an animation style to explain the concepts behind our professional development Tools. This had the advantage that we could produce them centrally and each partner could record their own voice-over. We moved the task out of WP1 (which finished in August 2014) into WP4 to give us more time to develop the animations. The task also had to wait until the Tool content had been fully decided, in early 2015, and then we worked through the process of creating a concept, writing scripts, and contracting and briefing an animator. The first video was ready for the pilot online courses, and has been translated into all 11 languages. However, our budget only allows are only able to fund a small 'video library' so we will look for a range of existing content, and make low-cost recordings of experts, in order to have sufficient content for all our courses.

Resources

The resource usage table shows the planned person months over the period compared to the actual time spent per partner on WP3. Several partners spent less time on WP3 than predicted. This is mostly because of the extra objectives (the curriculum and professional development frameworks) causing delays in creating the online courses. This will be accommodated in the second half of the project where correspondingly more development is taking place.

Partner	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL
	SHU	OU	FORTH	FAU	ELS	TRACES	VUT	WEIZMAN	UB	HiVe	TU Delf	DICS	LIETUVO	UNic	
Planned for months 1-18	7.00	3.75	1.50	0.50	0	1.50	1.00	1.25	1.00	0.75	0	1.00	0.75	2.00	22.00
Actual for months 1-18	4.2	1.2	0.4	1	0	3.5	1	2	1	0.97	0	0.96	1.22	2.00	19.45

3.4 Work Package 4 - ADOPT

This Work Package is led by FORTH (Greece). The overall goal of WP4 is to attract large numbers of science teachers into using ENGAGE materials, and encourage them to use the other strategies.

WP4 produced several significant results

- Each country prepared and implemented local plans for dissemination
- Large numbers of teachers using ADOPT materials in most countries
- Pilot online courses were run in two countries

Figure: Teachers at a workshop in Spain, exploring the rationale behind the ADOPT material 'Big Bag Ban'

Figure: How ENGAGE materials and news is disseminated to German teachers

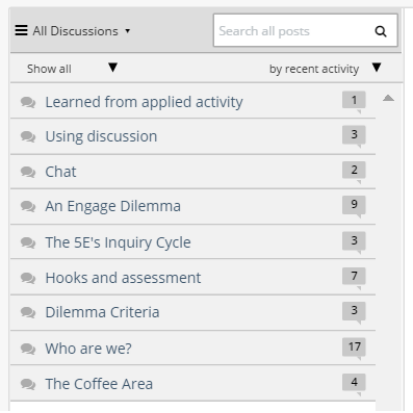


Figure: The discussion forum of the pilot UK online course, with 40 posts from participants.

Objective 1: To get large numbers of teachers using ENGAGE ☑

T4.1 Localised Dissemination Plan & Networking

Overall, as a result of intensive dissemination, most partners have managed to get promising numbers of teachers engaged in this first period. We have reached the overall target, with nearly 6000 users register on the ENGAGE platform.

These large numbers are critical because ADOPT is the first step of our three stage model and only a proportion will progress to the ADAPT stage. Of these, only another proportion will make it to the TRANSFORM stage. The primary means of attracting teachers has been our materials, which embed RRI-based teaching techniques and create positive experiences which encourage teachers to do more in ENGAGE. The key task for partners has been to disseminate the materials. For this WP4 created a general dissemination and networking plan **(see D4.7 section 3),** which each partner converted into a customised local plan **(see D4.7 Appendix).** In some cases, for countries with large targets, this plan relied heavily on direct e-marketing to a mailing list of teachers. In other countries, with smaller targets, the plan involved more face-to-face persuasion, with workshops and meetings with teachers and school influencers. The WP4 leader set up a monitoring system to review the numbers, and share successful strategies.

We found that many partners found direct marketing challenging, as they did lacked experience in its techniques. We supported this with an attractive newsletter template for every new publication. We also shared strategies to build up a mailing list, through partners' contacts, or by partnering with a national organisation. Overall, we found direct marketing was generally successful at bringing teachers to our website, where it became used effectively, and where partner used social media to amplify newsletters.

The table below sets out detailed figures for ADOPTT dissemination so far. Several countries exceeded their targets for teacher registrations: United Kingdom, Israel, Norway, and Lithuania, have also managed to over-reach their targets. Switzerland achieved the target and Spain, Romania, Greece and Cyprus reached at least the 75% level. Clearly big countries faced the most challenge, and two of these, Germany and France were not successful in terms of registration, recruited less than 15% of their target.

At the Crete meeting in May 2015, France, Germany, Spain, Greece and Cyprus were identified as at risk of not meeting their targets. Revised dissemination plans and monitoring mechanisms were introduced to

address these problems and by the summer, figures had improved. The problem in Germany was that teachers expect to access and download free resources without registering and are apparently unwilling to do so. Their strategy was to provide open access to materials, without the barrier of registration. This did result in substantial numbers of downloads but no information about the teachers for evaluation. It also made it difficult to track teachers into the following ADAPT and TRANSFORM stages. In June 2015, the registration was re-imposed and this resulted in a modest 102 teacher registrations. Our French partners faced a different challenge. TRACEAS is a science centre used to working with highly experienced science teachers, and did not have ready access to the 'novice RRI teachers' we wanted to engage in the ADOPT stage. Their strategy was to partner with another organisation who did have a large mailing of schools, and this has seen registrations increase from 38 in May to 92 in August 15, However, recruitment is likely to remain a challenge and could compromise reaching their targets.

Our website statistics allowed us to monitor how many materials each teacher was downloading. On average this was 4.5 per teacher, but there was considerable variance between countries. In Lithuania it was 18.7, perhaps reflecting a high value that teachers placed on the materials. Whereas Greece and in Israel, it was below 1, suggesting the teachers did not find the materials so valuable, or that dissemination was not able to reach the intended 'novice teachers'.

	Materials usage (new teachers/ yr)	
Partner	Target (Download: Teacher ratio D:T)	Achieved
FAU/ Germany	700 D:T ratio 7756:(102) (76)	No registrations recorded before June 15. From June – Sept following new marketing strategy, 102 teachers registered 7756 downloads and 2,000 website visits via the external webpage – Teachers online (can't be tracked).
SHU/UK	650 D:T ratio 8000:3600 2.2	3600 registered teachers (8000 activity downloads, 15000 including teacher notes)
TRA/France	600 D:T ratio (718):92 7.8	92 registrations, but 'good visibility'. New dissemination strategy for 2015-6 718 material downloads (incl. Swiss)
DICS/ Switzerland	40 D:T ratio 336:63	63 registered Swiss users (via French site) 336 downloads

	5.3	
UB/Spain	450 D:T ratio 2051:426 4.8	426 registrations. Strategy to advertise and promote site further. 2051 downloads
VUT/Rom	200 D:T ratio 494:200 2.5	200 registered users. Visitors to website = 1648, visits = 24138 Downloads = 494
FOR/Greece	100 D:T ratio 50:74 0.7	74 registrations Material downloads = 50
WZ/Israel	80 D:T ratio 73:330 0.2	330 registered 'subscribers' 73 material downloads
HIV/Norway	50 D:T ratio 731:103 7.1	103 registrations 731 material downloads
LEU/ Lithuania	40 D:T ratio 3776:202 18.7	202 registrations 3776 material downloads
UNIc/Cyprus	20 D:T ratio 25:25 1	25 registrations. materials not part of curriculum 25 material downloads
All partners	2930 D:T ratio 5217:2930 4.5	5217 registrations

Key to teacher registration target

On/exceeded target

Close to target

Below target

Objective 2: Run ADOPT workshops and online courses– in progress

T4.2 Programme Implementation, Workshops & MOOC

All partners have devised and run local Workshop workshops with teachers, based on the professional development framework. Our 17 workshops managed to attract 350 teachers. Two partners have run the first versions of ADOPT/ADAPT online courses, and the rest have planned for them to run in October and November 2015 (see Table 8 D4.8 for dates per country).

Our Workshop programme is based on a 1 day event to give teachers an understanding of the first two professional development Tools - Dilemma Lesson and Group Discussion. The goal was to equip and encourage teachers to use the Tools immediately in their schools, with the support of the ADOPT materials **(see D4.8, p19).** 17 *workshops took place* in this period, and *more than 350 teachers* participated.

Our online courses started to be rolled out, once we had used our Tools to create online course content, and set this up on the course environment. Early testing was done in Romania, with 10 prospective teachers using some of the course activities. Then the course was fully piloted in the UK during July 2015. The most important result of the pilots was a list of technical requirements problems to be fixed before other countries rolled out the course, to give the teachers a more positive experience. In response to teacher requests at our Workshops, we also produced a course handbook with detailed descriptions of all the RRI teaching strategies.

Despite the delay to rollout already described, we are still able to schedule the target courses during the second period of the project. The ideal would be to have an extension of several months so that there is sufficient time for teacher to use the materials for ADOPT, ADAPT and TRANSFORM and then develop the interest in studying the accompanying courses. The table below summarises the workshop attendance, and online course plans for all partners.

Adopt stage outcomes (to August 2015)

Partner	Workshop attendance (teachers/yr)		Online course participation (teach/yr)	
	Target	Achieved	Target	Achieved
FAU/ Germany	30	Workshop for in-service teachers and students planned for 20th & 23rd Oct 2015	25	Planned for Oct 15
SHU/UK	30	1 workshop piloted late in July 15, delayed. 14 teachers.	25	1 pilot MOOC July 15. Delayed due to tech issues. v small nos.
TRA/France	30	12	25	No info provided
DICS/ Switzerland	10	Workshop in Berne May'15 (18 teachers) part of national education congress). 2 planned for Autumn 15.	10	1 online course planned for Autumn 15.
UB/Spain	25	2 workshops run (in summer)	20	Nov 15 due to delays with WP2&3

VUT/Rom	20	1 workshop, June '15, 25 participants	20	Pre-test/pilot – with 10 student teachers in March - April 15. MOOC live in Autumn 15.
FOR/Greece	20	1 with 27 participants	15	MOOC development has been delayed - as such we were not able to implement ADOPT online course within the time envisioned in the DOW
WZ/Israel	15	Oct 14 - 6 Jan 15 - 20 March 15 - 15 July 15 - 22 (63, incl. pilot)	15	Starting date: Oct 15 On-line course : piloting the dilemma and discussion tools using Moodle
HIV/Norway	15	18 teachers in 1 workshop in June 15	15	Piloted in May-June 15
LEU/ Lithuania	10	3	10	0
UNIc/Cyprus	10	3 workshops	10	none in summer - next semester

Objective 3: To support teacher reflection with online content – in progress

T4.3 Online Content for reflection

We intend our website to turn into a community of interest where science teachers can learn about RRI from other like-minded teachers, and experts. For this to happen, we planned to create additional content about the pedagogical rational of the materials, and stimulate teachers to write their own thoughts on the site. We are still at an early stage, seeding the community development. We have created FAQs, and put information about the professional development Tools into teacher's guides. In some countries, teachers have been writing reviews of the materials which other teachers are reading.

However, we have not been able to focus as much on the community content as expected during the first period. The extra objectives of creating the professional development and curriculum frameworks occupied a lot of resources. Now we have created all the content, we are starting to turn it into web content. We have also added functionality to the site to encourage more user-generated content. First, we created a ratings system with three criteria to judge materials by: engagement, skill development, and knowledge application. Second, we gave teachers the ability to reply to other teachers comments, so we and our 'expert RRI teachers' can start reflective conversations. This has been used particularly well in Spain, with lively posts and replies discussing pedagogical issues. Third, we added a personalisation function to remind teachers to review the last downloaded materials whenever they visit the site.

Resources

The resource usage table shows the planned person months over the period compared to the actual time spent per partner on WP4. This shows that six partners used more time than estimated on WP4. This is

because they invested more in setting up dissemination strategies to properly establish the ADOPT phase. Partners 4 and 6 found this a particular challenge, using more time than estimated.

Partner	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL
	SHU	OU	FORTH	FAU	ELS	TRACES	VUT	WEIZMAN	UB	HiVe	TU Delf	DICS	LIETUVO	UNic	
Planned for months 1-18	2.25	0.00	3.50	2.25	0.00	2.00	1.75	1.75	2.25	1.75	0.00	1.75	1.75	1.75	22.75
Actual for months 1-18	2.1	0	3.4	4.5	0	4.5	1.5	1.75	2.55	0.99	0	2.86	2.93	1.78	28.86

3.5 Work Package 5 - ADAPT

This Work Package is led by Universitat de Barcelona (Spain) and its goal is to roll-out the second stage in our programme, ADAPT, to teachers across 11 countries. WP5 is at an early stage. The systems for implementation have been put in place and the actual roll-out has recently started.

WP5 produced several significant results:

- All partners created localised dissemination and networking plans for ADAPT
- A Strategy to encourage teachers to progress from ADOPT to ADAPT and stay engaged

Objective 1: To 'deliver' the ADAPT stage in each partner country – in progress

T5.1 Localised Dissemination Plan &Networking ☑

We have successfully began the roll-out of ADAPT's publishing, dissemination, and online courses to teachers across 11 countries. Led by UB, each partner has defined a local plan based on commonly agreed principles. First we ensured partners had a common understanding of ADAPT and its place in our three stage model. Then we defined types of activity related to materials, online courses, and how to form a community. As with ADOPT< partners planned how to use the most effective dissemination channels in their countries for how to get teachers to download materials, and to enrol in our online courses. From the individual plans, we synthesised the main opportunities, threats, and solutions for the ADAPT stage which were shared with partners. We have a regular monitoring system in place.

Objective 2: To support teachers in transitioning to RRI-based teaching – in progress

T5.2 Programme Implementation & MOOC ☑

T5.3 Mentoring to support change practice (next reporting period)

We have formulated a strategy for helping teachers transition from ADOPT stage to ADAPT stage, which is being put in place. First we are directly encouraging teachers who we know are ready to join ADAPT by a) using data on teachers' use of ADOPT (downloads, comments) to identify the most active users who we then invite to progress. Second we have created a 'self-promotion' function on the website where teachers simply answer two questions about their use of ADOPT, and then they are automatically promoted. We have engineered it so that joining ADAPT has several additional benefits which make progression attractive. There are the 'advanced materials' of ADAPT, which are only accessible to teachers who have been promoted. Also, ADAPT teachers get a user profile page where they can provide information about their interest and network with other teachers. In this way we are creating a feeling that ADAPT (and TRANSFORM) represent joining a club of 'advanced users'.

The second challenge is to keep teachers engaged in the ADAPT programme. We have planned to use an individualised approach. A personal invite to take part in the online course will go to teachers who regularly publish reviews of ADAPT materials, and dialogue box appears when teachers logon to encourage them to be more active in the community by submitting reviews or answering other teachers' comments.

Resources

The resource usage table shows the planned person months over the period compared to the actual time spent per partner on WP5. Most partners spent less than planned on WP5. This was because of the few month delay in the ADOPT strategies which had a knock-on effect for WP5. All partners planned the roll-out as shown in Deliverable 5.1 but began the main work on ADAPT dissemination just after the 18 month reporting period.

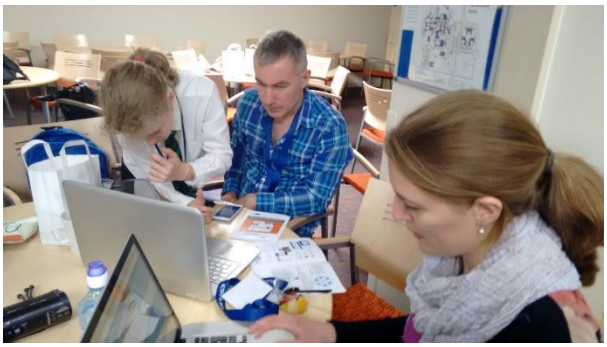
Partner	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL
	SHU	OU	FORTH	FAU	ELS	TRACES	VUT	WEIZMAN	UB	HiVe	TU Delf	DICS	LIETUVO	UNic	
Planned for months 1-18	1.00	0.00	1.00	1.00	0.00	0.83	0.67	0.67	1.67	0.67	0.00	0.67	0.67	0.67	9.50
Actual for months 1-18	0	0	0	1.5	0	0.5	0.25	0	1.96	0.06	0	0	0	0.91	5.18

3.6 Work Package 6 - TRANSFORM

This Work Package is led by TRACES (France). The goal is to catalyse the transformation of teachers coming from earlier stages to become 'expert RRI teachers', who know how to teach using socio-scientific issues.

Significant results for this period

- Identification of key issues in bridging RRI and science education, through RRI seminar (see Wp7)
- Definition of Transform dissemination strategy, in particular stakeholder engagement
- Piloting of Transform projects



Students working with a scientist on a pilot 'Transform' project, based on our 'Electric cars' material

Objective 1: To propel a proportion of teachers to the transformational stage – in progress

T6.1 National Experts Networking & collaboration
T6.2 Brokering School & Experts Partnerships

The TRANSFORM stage is currently at the planning stage, and has not been rolled out. Yet we have done a lot of work on piloting and building stakeholders, so we can make a fast start, once the initial offering of a course and materials are ready. Delays incurred in the first two stages of the project have meant that these will be rolled out later than planned.

One of the key features of TRANSFORM is how we get schools working with external stakeholders such as scientists or journalists. First we conducted an RRI seminar in September 2014, gathering representatives of more than 20 FP7 funded projects, to discuss different ways of working with stakeholders on RRI. Then we consulted with partners, and reviewed the literature to formulate our strategy, which we presented in a Dissemination & Networking Plan **(D6.11,** p. 18-22**).** This will put us in a good position to act fast once TRANSFORM materials and courses are ready to launch at the beginning of 2016.

Resources

The resource usage table shows the planned person months over the period compared to the actual time spent per partner on WP6. TRANSFORM is the last stage in the project so that given the delay in roll out of the previous stages, we did not plan to use any significant time on TRANSFORM by most partners, except for those partners coordinating TRANSFORM (TRACES) and the previous stage ADAPT (UB). The table reflects this. TRACES has declared higher use of person-months than expected at the beginning, due to the repartitioning of work between the managing team and a young coordination team.

Partner	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL
	SHU	OU	FORTH	FAU	ELS	TRACES	VUT	WEIZMAN	UB	HiVe	TU Delf	DICS	LIETUVO	UNic	
Planned for months 1-18	0	0	0	0	0	1.5	0	0	0	0	0	0	0	0	2
Actual for months 1-18	0	0	0	0	0	1	0	0	2	0	0	0	0	0	3

3.7 Work Package 7 - Legacy

This Work Package is led by the Open University (UK). The overall goal of WP7 is to develop strategies to disseminate ENGAGE to all stakeholders and leave a legacy.

WP7 produced several significant results

- An RRI seminar linking experts from many projects in discussion
- Promotion of ENGAGE at many national and international events

Experts discuss how to get RRI into school.

Objective 1: Strategies for promoting widening awareness ☑

T7.1 RRI Seminar and Experts meeting

T7.2 Dissemination plan and branding

Early on we produced a dissemination strategy and branding materials which the partners felt were strong. Since then we have been spreading ENGAGE first to teachers using a variety of methods, from direct emarketing, to social media (Twitter, Facebook), and through a YouTube channel where we have more than 25 video clips. We have also started making partnerships with other stakeholders like scientists, who we will be working with in the second period.

In September 2014 we ran an very successful international seminar on Responsible Research and Innovation and Science Education, with fifty experts from various fields. The aim of this seminar was knowledge exchange among FP7 and H2020 projects and experts interested in RRI and Inquiry Based Science Education (IBSE).

One highlight of our dissemination was that seven secondary pupils from Stantonbury School in the UK represented ENGAGE at the ICTPI 2015 international conference. They presented a project based on the ENGAGE material Electric Cars. The ENGAGE consortium has also attended various events to disseminate the project, published papers and given presentations at scientific conferences. The table below highlights the main activities.

5/4/2014	7/4/2014	NSTA2014 National Science Teachers Association	Boston, EUA	International Conference	Workshop about Authentic Inquiry: Raise Motivation and Results with Real Science	SHU UK / OU - UK
5/5/2014	8/5/2014	PCST2914 Public Communication of Science and Technology Conference	Salvador Brazil	International Conference	Presentation of papers and informal talk about ENGAGE project	OU UK / TRACES
22/05/2014	25/05/2014	The 2014 Ecsite Annual Conference	Hague, Netherlands	European Conference		TRACES
25/06/2014	28/06/2014	I International Forum of Education and Technology	Tarragona Spain	International Conference on Education and Technology	Project Presentation	OU UK
24/10/2014	26/10/2014	2ND SCIENTIX CONFERENCE	Brussels, Belgium	European Conference		FAU
13/05/2015	15/05/2015	International Congress on Education for the Future: Issues and Challenges (ICEFIC 2015)	Ankara, Turkey	International Conference	Presentation of literature review and informal talk about the Engage project	TUDelft
9/8/2015	9/9/2015	ITD 2015	Basel, Switzerland	International Conference	Research and discussions about transdisciplinary	HEP
		SCIENTIX 2015				SHU

		ESERA				FOR WZ
14/9/2015	18/9/2015	EC-TEL	Madrid Spain	International Conference	Workshop Smart learning ecosystems	OU-UK

Resources

The resource usage table shows the planned person months over the period compared to the actual time spent per partner on WP7. Most of the effort on Dissemination is in the second half of the project and the table reflects this with partners using variable but small amounts of time, depending on their local circumstances.

Partner	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL
	SHU	OU	FORTH	FAU	ELS	TRACES	VUT	WEIZMAN	UB	HiVe	TU Delf	DICS	LIETUVO	UNic	
Planned for months 1-18	1.25	2.38	0.75	0.50	0.25	0.50	0.38	0.38	0.50	0.38	0.25	0.38	0.38	0.38	8.63
Actual for months 1-18	0.2	1.3	0	2	0.34	1.2	0.25	0	0..08	0.09	0	0.41	0.3	0.8	6.89

3.8 Work Package 8 – EVALUATION

This Work Package is led by TUDelft (Netherlands) and its purpose is to provide internal evaluation of project implementation so that the consortium can continually improve its strategy.

WP8 produced several significant results:

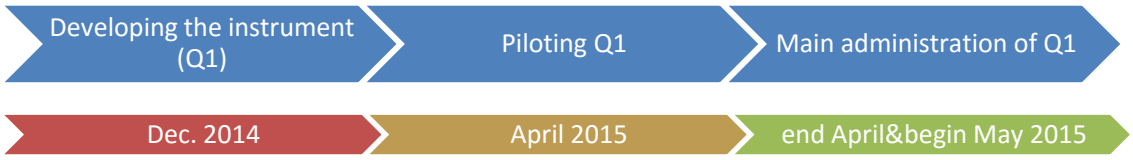
- Evaluation Framework
- An evaluation of Year 1 of ADOPT
- Evaluation of the Engage materials and workshops

We found a substantial increase in student engagement after students used ENGAGE materials

Objective 1: Internal evaluation of Adopt, Adapt and Transform implementation – in progress

T8.1. Evaluation Framework

We have carried out an evaluation of the first year of ADOPT and its materials, workshops and online course. For materials, we developed a questionnaire in English, had it translated into the other languages, and then ensured validity using a 'back translation' check. We pilot tested the survey 5 teachers from each country, and after analysing the results, a revised version was put online for teachers to give us feedback. This started at the end of April 2015 and finishes at the end of October 2015. The evaluation process is summarised in the figure below.



Initial feedback shows that teachers like to use the Engage materials because they are related to current issues in society, and are interesting and enjoyable for students. The only significant problem is the one we expected of it being difficult to find the extra time for Engage lessons.

To evaluate the face to face workshops, we developed a short questionnaire, and found that participants had a high degree of satisfaction with the workshops. They gained understanding of the two Tools as intended, and were keen to try more Engage materials and develop their own.

For the online course, we have created a questionnaire to get to know the teacher's goals before hand, when they enrol, which is followed by another questionnaire after they have completed the course. This has been piloted in the UK, and other partners are using it in October and November 2015.

Objective 2: Report about the impact on teachers and students – in progress

T8.2. Evaluations on the impact on teachers and students

T.8.4. Independent evaluation-External evaluation

A comprehensive evaluation of the ENGAGE programme is in planned through cooperation of the internal (TUDelft) with the external evaluator. It focusses on teachers in the ADAPT and TRANSFORM stages who have had more exposure to Engage. We have not started this as ADAPT has only recently begun.

We will be exploring two additional area of impact beyond the five dimensions of teacher change in the DoW, to provide a richer picture of our impact. The first is to explore whether the Engage programme enhances teachers' Pedagogical Content Knowledge (PCK). PCK is the knowledge to decide how best to help students learn specific subject content and skills. If we find Engage does improve PCK, this will be evidence that our three stage, three strategy model of teacher development works. The second new area of evaluation will be to carry out case studies, to explore differences between partner countries in how teachers use Engage materials. We will collect in depth data on one or two teachers per country.

Resources

The resource usage table shows the planned person months over the period compared to the actual time spent per partner on WP8. The efforts by most partners are similar to those predicted.

Planned for months 1-18	0.25	0.00	0.25	0.25	0.00	0.25	0.25	0.25	0.25	0.25	7.25	0.25	0.25	0.25	10.00
Actual for months 1-18	1.5	0	0	0.25	0	0.2	0.35	0.25	0.25	0.07	6.25	0.08	0.40	0.22	9.82

4 PROJECT MANAGEMENT DURING THE PERIOD

Sheffield Hallam University (SHU) is the Project Coordinator and Project Manager for ENGAGE.

WP9 produced several significant results:

- A culture of strong collaboration between partners
- Regular, productive meetings for all WPs
- Good systems for remote working and communication

ENGAGE partners in discussion at the Crete meeting 2015

Objective 1: Coordinate the project, and achieve objectives

T9.2 Project Supervision and reports

T9.4 Managing the external advisory group & independent evaluators:

Overall, as the individual WP reports show, we have been highly productive and are well on the way to achieving targets for teacher engagement in most areas. The project has many strategies and we have accomplished a great deal of development. We have also emphasised high quality standards, so that our outputs will have an impact on teachers. This approach has been largely successful, as judged by the positive

feedback on our materials. Deliverable reports have been completed on schedule, or with short agreed extensions.

ENGAGE is undoubtedly complex with many parts to each stage, and with later ones depending on the outputs of previous ones. Thus, because certain tasks took significantly longer, there have been delays to the roll-out of all the later tasks. The main impact is that later stages will not have as much time as originally planned to take effect. In retrospect, for a project with so much dependency and development, three years is too short a time. We have accommodated the delays into a new plan, and believe that with an extension of several months to the project timescale, we can reach our targets and make a greater impact.

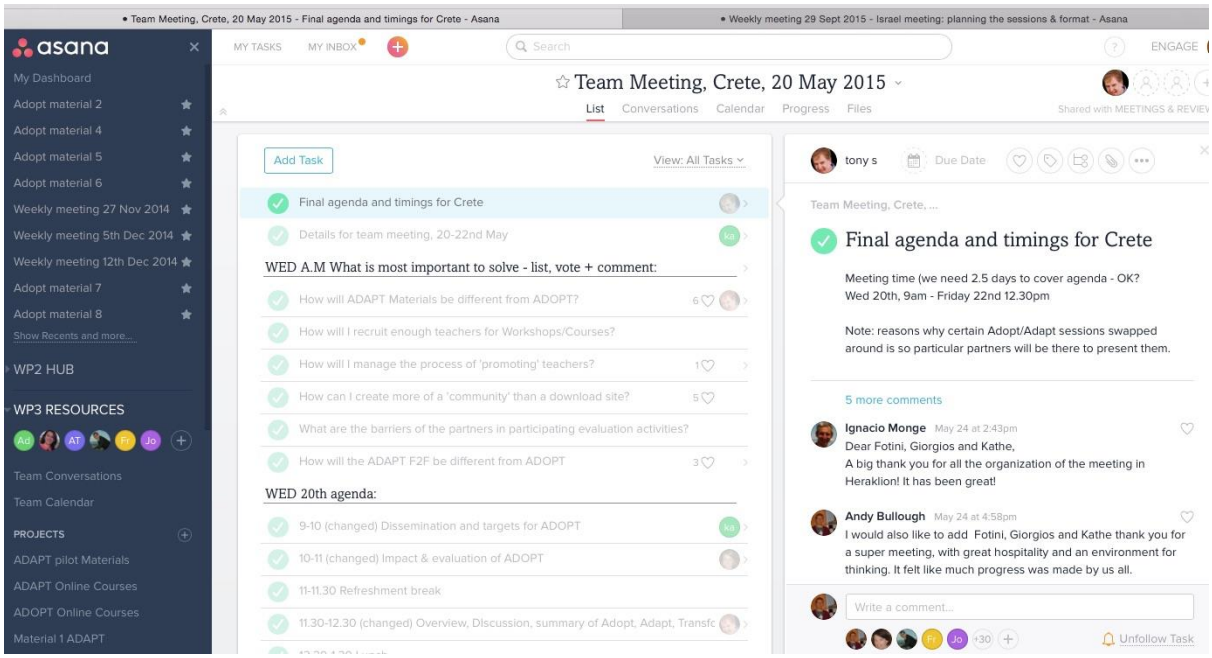
One change to the project has been our independent evaluator. CEIR, a centre in Sheffield Hallam University, were in this role until September 2015. Then because of restructuring there was a merger of CSE, who are coordinating ENGAGE and CEIR. To maintain the independence of the evaluation, a separate external consultant has been recruited to continue the external evaluation through to completion.

Another external partner we have appointed is an external advisor, Robert Marzano. A highly respected educational researcher, he has been helping us with state of the art practice in professional development. This collaboration will result in a published version of our Tools to provide teachers with the research background to enhance the credibility and impact of our online courses. We anticipate appointing one further advisor to help with the later stages of the project dissemination and legacy.

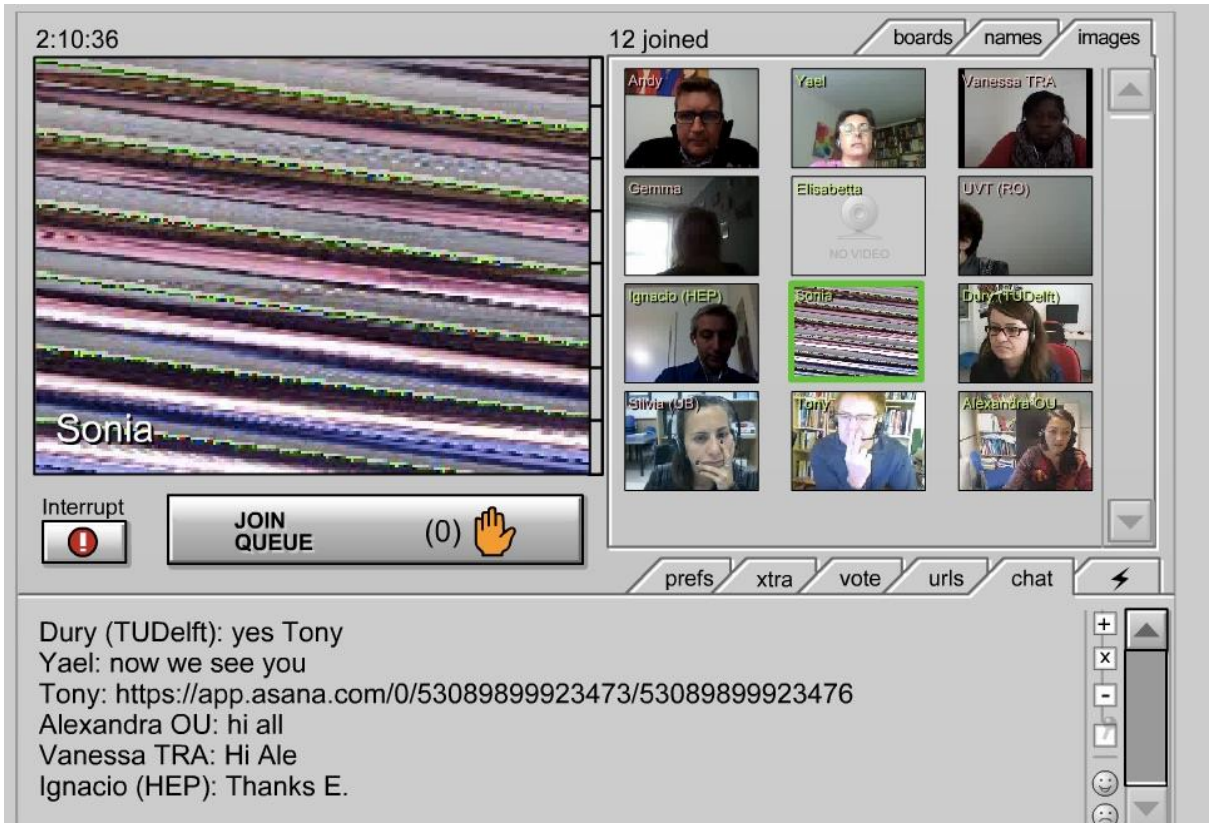
Objective 2: Manage the consortium and budget

T9.1 Coordination of the consortium and meetings
T9.3 Management of the project budget

We are proud of the way our consortium have worked together in a culture of creative distance collaboration. Part of this is because we took steps to establish strong communication systems from the beginning. We also use powerful software environments to develop content collaboratively: Asana, Google Apps, and the Open University's Flashmeeting. Asana provides structured discussion and task management and though it has been a challenge for some partners to learn, it has helped us keep progress visible, and organize effective communication. Asana enables each work package to be monitored in real time as tasks are created then completed in stages. All Work Packages and partnership relationships are managed through the Asana platform. Asana captures all of our progress including meetings notes and action points. The figure shows a snapshot of tasks on Asana.



A second area where we use collaborative technology is our weekly one hour Flash Meetings. These ensure all partners are involved in development and decision making, enable issues to be raised and immediate answers to be given. Flash meetings are recorded so that partners who were unable to attend can review later. Flash meetings score 8/10 for partner experience as a networking medium.



We have used Face to face meetings effectively to reach consensus on major decisions and solve more complex problems. Partner satisfaction with these has been a very high '9/10'. Full team meetings take place every six months, and in between The Steering Board meets through web conferencing. The table below sets out the full team meetings we have held.

Title	Date	Location / Host	Purpose	Comment
Project Kick-off and Steering Board (WP1)	24-27 January 2014	Open University, Milton Keynes England	To ensure partners have a shared vision and commitment to the project	all
WP2 meeting	3-4 July 2014	Lattanzio, Genoa, Italy	To develop knowledge hub strategy	sub-group
RRI Seminar (WP7) and Partner Meeting for WP3	22-24 September 2014	Traces, Paris, France	Holding first RRI Seminar and to endorse the Adopt strategy	all
Steering Board	4-5 January 2015	Starling Hotel, Geneva, Switzerland	Meeting to review progress, evaluation, challenges and future activity	
CPD Framework and delivery of courses (WP3 and 4)	24-25 March 2015	FAU, Nuremberg, Germany	Localisation of CPD for face to face and online courses	WP/s sub group
Adopt / Adapt / Transform (WP 4/5/6) & Steering Board	20-22 May 2015	FOR, Crete, Greece	Review Progress and plan next steps - share experience.	all
(WP5) Adapt detail skills development content for teachers	6-7 July 2015	Open University, Milton Keynes, UK	To write intensively and collaboratively to ensure localisation and quality	WP/s sub group
WP5/6	27-28 October 2015	Weizmann, Israel	Review progress and plan next steps	all

There was one change in the SHU Coordination team. As of 9/9/15 Pat Morton the project manager retired and handed over the project management role to Andy Bullough. There also was one change in the Consortium. TUDelft, who are leading WP8, changed the managing department in the institution. Prof. Dr.

Patricia Ossewijer from the Biotechnology and Society department at TUDelft was originally managing ENGAGE, but due to changes within the team, she asked colleagues within Science Education and Communication Department to adopt the project. Maarten van der Sanden is now managing ENGAGE. Because of the change, work on WP8 started a few months later than planned, as reported to the Project Officer. TUDelft has since managed to catch up and get on track with all evaluation activities.
We have endeavoured across all WPs to ensure gender equality. For instance, we allocated time within the kick-off meeting to reflect on issues and identify actions required. ENGAGE has maintained a gender inclusive approach to the use of contexts which are engaging for girls and boys in all teaching materials. Our evaluation plan also includes gender awareness.

There has been one change to the legal status of beneficiaries. A grant amendment was requested by the project co-ordinator in Summer 2015 as the Norwegian Beneficiary organisation had a change of name form Hogskolen I Vestfold to Hogskolen I Buskerud Og Vestvold. This was modified by the European Commission Directorate for Research and Innovation.

Ethics procedures have been incorporated according to the DoW. The copy of official approval has been submitted to the Commission and the Engage Ethics protocol is included in the appendix.

In Stage One the Project Co-ordinator provided all beneficiaries with detailed procedures for recruitment of participants and the nature of the material to be collected, along with informed consent and procedures relating to the participation of children. Detailed procedures and confidentiality requirements relating to data protection were also included at this stage along with a strategy for handling potential incidental findings that may emerge. These elements were covered in detail within the Consortium Agreement.

In Stage Two, all beneficiaries provided relevant local and national approvals regarding ethics and data protection to the Project Co-ordinator, and these were included in the submission to the European Commission prior to any research field work being undertaken.

In Stage Three, any queries raised concerning data -protection during the research to be referred to the Project Co-ordinator who will draw on the lead partner's institutional (SHU) Data Protection Adviser.

There are several other minor ethical issues connected with evaluation that will be incorporated within the above approval procedures:

- observation and evaluation of teaching in classrooms as part of the project evaluation process. This will be with informed consent and in line with existing practice of teaching observation in schools. All observations will be anonymised and made confidential.
- focus groups with students. These will be performed in compliance with the Guidance for Researchers and Evaluators of Social Sciences and Humanities Research and also relevant national ethical guidelines when needed. Researchers going into school will have appropriate checks carried out
- some teachers may for personal, or religious reasons, feel uncomfortable with discussing particular issues. All participation and use of materials will be entirely voluntary.
- we will be collecting aggregated student opinion data through the curriculum materials. Schools will be made of aware and have to give their consent, before data can be collected. This will be anonymised and made confidential, so that no individual school can be identified.

Resources

The resource usage table shows the planned person months over the period compared to the actual time spent per partner on WP9. SHU who are coordinating and project managing ENGAGE have spent significantly more time than expected based on a pro rata usage of person months. This is because of the need to set up policies, systems for project communication and management and establish relationships with partners.

Partner	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL
	SHU	OU	FORTH	FAU	ELS	TRACES	VUT	WEIZMAN	UB	HiVe	TU Delf	DICS	LIETUVO	UNic	
Planned for months 1-18	7.50	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	10.75
Actual for months 1-18	12.4	0	0	0.25	0.37	0	0.25	0	0.25	0.76	0	0.3	0.30	0.2	15.08

5. DELIVERABLES AND MILESTONES TABLE

5.1 Deliverables

The table below shows that all but one of the planned Deliverables have been submitted according to schedule. D4.8 for WP4 was extended with EU agreement to 30.9.15 due to delays in aspects of course delivery. There may be a need to request extensions of several months for deliverables relating to ADAPT and TRANSFORM implementation. This is because as explained earlier, we had to spend longer on the first phase of the project to create additional curriculum and professional frameworks, and set up the online course platform.

Del. no.	Deliverable name	WP no.	Lead beneficiary	Planned delivery date (month)	Actual	Status No submitted/ Submitted
D1.1	RRI Curriculum document	1	1	6	27.6.14	submitted
D1.2	Reference Guidelines with exemplars for Learning Content & Teaching Training	1	1	8	30.9.14	submitted

D2.3	Knowledge Hub Platform	2	5	9	30.9.14	submitted
D2.4	Support Web Tools	2	5	9	30.10.14	submitted
D3.5	RRI OER Annual reports	3	1	12	30.12.14	submitted
D3.6	RRI OER Reference Guidelines	3	1	12	30.12.14	submitted
D4.7	Adopt Dissemination & Networking Plan	4	3	12	19.12.14	submitted
D4.8	Annual Report on Adopters' Programme Implementation	4	3	18	30.9.15	submitted
D5.9	Adapt Dissemination & Networking Plan	5	9	18	29.6.15	submitted
D5.10	Annual Report on Adapters' Programme Implementation	5	9	24		not due
D6.11	Transform Dissemination & Networking Plan	6	6	20	30.06.15	submitted
D6.12	Annual Report on Transform Programme Implementation	6	6	24		not due
D7.13	Project Dissemination plan with branding materials	7	2	6	27.6.14	submitted
D7.14	Exploitation Plan	7	2	30		not due
D7.15	Interim impact and policy report	7	2	26		not due
D8.16	Evaluation Plan - indicators, Impact and Influence	8	11	12	18.12.14	submitted

D8.17	Annual Reports on Evaluation	8	11	22	07.11.15	To be submitted
D9.18	Periodic Reports	9	1	6	27.6.14	submitted
D9.19	Project Steering Committee Meetings	9	1	3	20.6.14	submitted
D9.20	External Evaluator Check Points Report	9	1	12	19.12.14	submitted
D9.21	Mid-term Review Report	9	1	22	30.10.15	submitted
D7.22	Final impact and policy report	7	2	36		not due

5.2 Milestones

	Milestone name	Work Package involved	Expected date / achieved date if different	Means of verification / current situation
M1	Completion of Phase 1 (preparation)	WP1	M06 M08 (extended to M09)	a) D1.1 RRI Curriculum document / **submitted** b) D1.2 RRI Guidelines with Exemplars for Learning Materials & Teaching Training / **submitted**
		WP2	M09 M09	a) D2.3 Knowledge Hub (1st release) / **submitted** b) D2.4 Web Support Interface & Tools / **submitted**
		WP7	M06 M09	a) D7.1 RRI Seminar and Experts (1st) meeting / **Seminar held**. b) D7.2 Dissemination plan & branding / **submitted**
		WP8	M12	D8.1 Evaluation plan / submitted and on track with rollout of project
		WP9	M03	a) D9.2 Project Steering Committee Meetings / **submitted**
		WP9	M12	b) D9.20 External Evaluator Check Point Report / **submitted**
M2	Completion of Phase 2 (deployment)	WP3	M12 M12	a) D3.5 RRI OER Annual report (with plan)/ **submitted** b) D3.6 First RRI OER Reference Guidelines / **submitted**
		WP4	M12 M18 (extended to M21)	a) D4.7 Adopt Dissemination & Networking Plan / **submitted** b) D4.8 First Annual Report on Adopters Programme /**now 30.9.15 / M21**
		WP5	M18 M24	D5.9 Adapt Dissemination & Networking Plan / **submitted** D5.10 First Annual Report on Adapters Programme
		WP6	M20 M24	D6.11 Transform Dissemination & Networking Plan **submitted** D6.12 First Annual Report on Transform Programme

		WP7	M17	T7.1 RRI Seminar and Experts meeting **Completed** T7.2 Dissemination plan updated **Completed**
		WP8	M22	D8.17 Annual Reports on Evaluation
		WP9	M22 M22 M22	D9.21 Project Steering Committee Meetings D9.21 Mid Term review External Evaluator Check Point Report
M3	Completion of Phase 3 (evaluation/legacy)	WP7	M27 M30 M34 M36	T7.1 RRI Seminar and Experts (3rd) meeting D7.2 Exploitation Plan T7.3 RRI Academy Festival of best practice D7.3 Impact and policy report
		WP8	M30 M36	T8.1 Evaluation plan updated T8.2 Final annual report on Evaluation
		WP9	M29 M36 M36	D9.2 Project Steering Committee Meeting D9.1 Project Report D9.3 External Evaluator Check Point Report