Ark of Inquiry

newsletter 2/2016 issued by the Ark of Inquiry project consortium

Welcome, dear Subscriber!

This is the sixth official newsletter of the Ark of Inquiry project. We are thankful for your interest in the project. In the newsletter you will find information about the latest news and upcoming events.

We hope that you have had time to enjoy spring and that you're excited for summer!

The Ark of Inquiry project is now in the large-scale implementation phase. During the last months, we have been fine-tuning the project materials and planning the upcoming trainings, which will soon commence in 12 different countries all over Europe. The trainings will help teachers to implement inquiry learning in their classroom and to use the Ark of Inquiry web-based platform in their everyday educational settings. Most of the trainings will start in September 2016, but some have already started. Be sure to contact your local coordinator if you'd like to know more about the trainings and other opportunities to participate in the project.

We hope that you have already browsed our web-based materials, which offer a great introduction to our project, the trainings and inquiry learning in general. You will also be happy to know that the Ark of Inquiry project platform is now open for everyone. The collection of inquiry activities in the platform has increased from 68 to more than 280, and it will continue to grow. Now there are activities in Greek, Turkish, French, Finnish, Dutch, Estonian and in many more languages in addition to English. Be sure to check it out now!

In this newsletter you will have the opportunity to learn more about Responsible Research and Innovation (RRI) and how it could be implemented in the classroom. You will be able to find out more about the inquiry activities in the Ark of Inquiry platform that help to implement RRI in your classroom. As usual, you will learn what has happened in the past couple of months and find out which events are worth looking forward to in the upcoming months.

Ark of Inquiry large-scale implementation is about to start!

Are you a teacher? A pupil? Do you want to engage in hands-on science activities? Do you want to have fun learning and teaching science? Take part in Ark of Inquiry activities near you! To find out more, contact your local coordinator.

Upcoming events

Ark of Inquiry will be presented at the EuroScience Open Forum (ESOF) on 23–27 July 2016.

ESOF is a biennial, pan-European, general science conference dedicated to scientific research and innovation.

Ark of Inquiry will be presented at the 5th World Conference on Science and Technology organized by ICASE (International Council of Associations for Science Education).

It is scheduled for Titanic Beach Resort Hotel, Antalya, Turkey from 1–5 November 2016. The theme of the conference is Interdisciplinary Practices in Science and Technology Education.

More upcoming events on our website!

About the project:

Project Title:
Ark of Inquiry: Inquiry Awards for Youth over Europe (FP7, No. 612251)
Funding Scheme:
EU-FP7-SCIENCE-IN-SOCIETY-2013-1 (CSA-SA)
Duration:
4 years (March 2014-Feb 2018)

Consortium: 13 partners coordinated by Tartu Ülikool (University of Tartu), Estonia: Ellinogermaniki Agogi Scholi Panagea Savva AE, Greece; Turun Yliopisto (University of Turku), Finland; Panepistemio Kyprou (University of Cyprus), Cyprus; UNESCO Regional Bureau for Science and Culture in Europe, Venice, Italy; Hogeschool van Arnhem en Nijmegen (HAN University), The Netherlands; Bundesministerium für Bildung und Frauen (Austrian Federal Ministry of Education and Women' s Affairs), Austria; Humboldt-Universität zu Berlin (Humbolt University), Germany; Bahcesehir Egitim Kurumları Anonim Şirketi (BEKAS), Turkey; Ecole de l'ADN (DNA Learning Centre), France; University Colleges Leuven-Limburg (previously KHLim), Belgium; Kutató Tanárok Országos Szövetsége (Hungarian Research Teachers' Association), Hungary; SA Teaduskeskus AHHAA (AHHAA Science Centre), Estonia

European Union's
Seventh Framework Programme

Where to find Ark of Inquiry? Visit our website!

www.arkofinquiry.eu

News from the field

© UCY

Ark of Inquiry has been introduced in Cyprus

In October 2015 and in January 2016, the ReSciTEG group at the University of Cyprus organized two two-day in-service courses for secondary school teachers in the context of the Ark of Inquiry project. During these meetings, the project goals were presented and the teachers engaged in inquiry activities as learners, reflecting on and discussing the learning experiences. The teachers had the opportunity to visit the project's website and were provided with information about the web-based materials of the project. Also, they studied a set of activities from a biology textbook (developed in the SEMEP project) and designed an inquiry-based teaching intervention. After familiarizing themselves with the Ark of Inquiry platform and creating user accounts, they did two online inquiry activities from the platform and considered how to undertake inquiry activities from the Ark of inquiry platform with their pupils. After these meetings, the teachers worked together with scientists and researchers in order to design and implement inquiry activities in their classes. The inquiry activities covered topics such as Natrix natrix cypriaca (a Cyprus native grass snake), Tulipa agenensis (a native plant species), cultivation of the mushroom Pleurotus, etc.

At a more recent meeting in March 2016, several groups of pupils (13–18 years old) who had engaged with the Ark of Inquiry project presented the inquiry projects they undertook with the help of their teacher and a scientist/researcher. The teachers and pupils were enthusiastic and perceived the overall opportunity as an interesting and challenging experience. During their presentations, the pupils appeared highly motivated, indicating that they were deeply engaged with the inquiry activities.

The Ark of Inquiry project aims to raise youth awareness to Responsible Research and Innovation (RRI) and to build a society skilled in RRI and related scientific communication. It will provide young European citizens (7 to 18 year olds) with a pool of activities to improve their inquiry skills, increase their awareness and understanding of conducting 'real' science, and prepare them to participate in different roles in the European research and innovation process.

To this aim the project will:

a) develop a framework for identifying inquiry activities that promote pupils' awareness of RRI;

b) collect existing inquiry activities and environments from various national and international projects;

c) make activities available across Europe through the Ark of Inquiry platform (implement the inquiry activities on a large-scale across a European school network such as the UNESCO Associated Schools Programme Network (ASPnet) so to bring together learners, and supporters (teachers, science and teacher education students, and staff of universities and science centres). During the project it is expected that at least 20 000 students will participate in the Ark of Inquiry.

d) train at least 1,000 teachers to support pupils' inquiry activities in a manner that attracts pupils' interest and motivation towards RRI.

Where to find Ark of Inquiry? Visit our website!

Ark of Inquiry had its mid-term review meeting in Brussels

Our project's mid-term review meeting was held in Brussels, Belgium on 7–8 June 2016. During the first day of the intensive 2-day meeting, the team worked hard to fine-tune the presentations and to make sure we were ready for the mid-term review. On the second day, we presented our work to our project officer and three reviewers. According to our reviewers, the project has made excellent progress and is ready for large-scale implementation. We are extremely happy to have such a wonderful team. We are also very thankful to our reviewers for all of their suggestions. It was truly a useful experience for all of us.

The Ark of Inquiry project was introduced in Hungary

On 23 April 2016 a conference was organized for science teachers by the Faculty of Science and Technology at the University of Debrecen in Hungary. The lectures, according to the main theme of the conference, were about innovative teaching methods and practices.

In her presentation "HRTA – 10 years of supporting the pedagogical innovation in Hungary" Ms Szilvia Tóth, vice-president of HRTA, summarized the events of the past 10 years and introduced international projects besides the recent and the coming activities. Around 100 participants, mainly science teachers, educators and policy makers got to know the Ark of Inquiry project website and platform as well as the aims and methods of the project. They were also given information about the Ark of Inquiry Awards and the upcoming events, such as the teacher trainings in Hungary.


© University of Debrecen

Where to find Ark of Inquiry? Visit our website!

What is RRI and how it can be implemented in the classroom

Reflections and discussions from Estonia

One of the aims of our project is to raise pupils' awareness of Responsible Research and Innovation (RRI) by promoting an interest in science through inquiry learning. In this article we look closely at what RRI is and how it can be implemented in and outside the classroom. Reflections and experiences from the Estonian classroom are shared by **Mirjam Burget from the University of Tartu**, who is doing her PhD on RRI and inquiry learning.

RRI is an emerging framework which in the context of our project has been characterized as *the attitude and ability to reflect on, discuss on and communicate processes and outcomes of inquiry for people themselves, others and for society as a whole.*

In short, RRI is a process where pupils actively engage in discussions and reflect upon their work. Discussion is also one of the phases in the inquiry cycle model that forms the basis of the Ark of Inquiry inquiry approach. Teachers who wish to integrate RRI into science lessons should encourage pupils to participate in debates, in participatory inquiry or by including socio-scientific issues in the lessons. Discussions in inquiry-based learning lessons are regarded as highly relevant by the Estonian teachers. For primary school teachers, it is important to encourage all pupils to participate in the discussions and to let various opinions be heard. Secondary school teachers often pay more attention to the ethical aspects of doing science, for example, by discussing with their pupils the cloning of animals or the negative aspects of data manipulation in research.

Besides encouraging pupils to discuss socio-scientific issues inside the classroom with their peers, teachers could also involve other societal actors in their lessons and discussions – they could ask scientists, parents or school alumni to come and visit their lessons to talk about their work or carry out experiments with the pupils. Teachers could also visit nature schools, science centres and museums that offer special science education programmes for pupils. Extracurricular science education provides an excellent opportunity to integrate RRI into science topics and experiments, as pupils of different ages can work together in diverse groups, having more time to focus on specific topics and engage in more discussions compared to lessons in traditional classroom settings. In addition to extracurricular programmes, Estonian pupils have also visited high-tech laboratories and companies. Teachers would like scientists and entrepreneurs themselves to approach the schools more often and offer opportunities for meeting and visiting.

RRI also encompasses the aspect of sustainability, and for the Estonian teachers, one way of introducing RRI related issues is to talk about sustainability and foster sustainability at school. Sustainability is a cross-curricular topic in the Estonian national curriculum and is implemented implicitly, thus being more familiar to the teachers than RRI. Teachers support the development of pupils' individual sense of responsibility and teach them how to take responsibility for their own actions. Other examples include teaching how to use the chemicals in experiments sustainably or talking about environmental safety when pupils are doing the experiments.

In conclusion it can be said that RRI has started to gain ground in Estonian schools. Ark of Inquiry actively promotes the integration of RRI aspects into science education in various ways. Firstly, a great effort has been made to raise teachers' awareness of RRI by dedicating parts of the web-based supportive materials and teacher training modules to RRI. The teacher training modules include examples which illustrate different ways to include RRI aspects in science lessons. The project has also developed a pedagogical scenario which supports teachers in designing RRI activities for their science classes.

See more information about **RRI and its relevance to teaching science on our website!**

Where to find Ark of Inquiry? Visit our website!

Inquiry activities: activities with a strong focus on RRI

As many of you may have noticed, the Ark of Inquiry portal is now available for everyone at arkportal.ut.ee. The portal features an ever-growing collection of inquiry activities in different languages and different domains.

In our last newsletter, we brought to you a selection of inquiry activities that were suggested by our pilot teachers. In this issue of the newsletter, we focus on activities that have a strong RRI focus.

Traffic Accident: who is to blame?

In this inquiry activity, pupils get to take the role of an investigator and try to solve a traffic accident.

The activity "Traffic Accident: who is to blame?" deals with the laws of motion and the idea of friction by an examination of skid marks related to an actual traffic accident. The pupils are thus introduced to the coefficient of friction through trying to solve an actual societal problem.

This activity is available in Finnish and in English.

Nanotechnology and the future of our food

In this inquiry activity, pupils learn how to critically reflect on the risks, challenges and consequences associated with the use of nanotechnology in the food industry. Digital skills are practised by using online websites, videos and repositories to gain and manage knowledge on nanotechnology. Pupils learn how to cooperate in groups, how to discuss, how to formulate arguments and how to critically reflect on complex scientific issues. After the completion of this activity, pupils have gained an understanding of the personal and overall consequences based on the outcomes of the inquiry process.

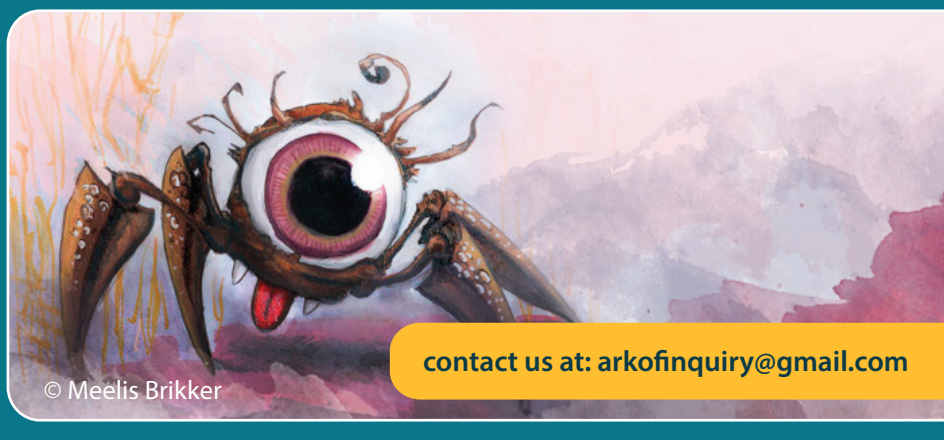
Solar car

This activity aims to familiarize learners with the impact of transport emissions on air pollution and how these could be reduced by building solar powered cars. The unit provides learners with opportunities to discover the significance of adapting and using solar energy in transportation whilst exploring relevant mathematical and scientific content. In the activity, learners complete a number of activities in mathematics, science and technology, applying knowledge from all three disciplines. Building on existing understanding and working on interdisciplinary activities, learners are offered the opportunity to design, build and operate their own model solar car.

In the next newsletter:

- Find out more about the Ark of Inquiry platform and activities inhabiting it;
- see what was done in Ark of Inquiry during the summer months;
- and find out what events are worth looking forward to in autumn.

Dear Subscriber, we wish you all the best and hope to see you again soon!



contact us at: arkofinquiry@gmail.com