



Ark of Inquiry: Inquiry Activities for Youth over Europe

Deliverable D7.5

Report of dissemination and exploitation activities 4

Editor	Lauren Bohatka
Date	(UNESCO) 27.02.2018
Dissemination level	Public
Status	Final

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under Grant Agreement No. 612252



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List of Acronyms

DoW	Description of Work
EC	European Commission
ECSITE	European Network of Science Centres and Museums
ESEA	European Science Education Academy
ESERA	European Science Education Research Association
EU	European Union
HQ	Headquarters
IBSE	Inquiry-Based Science Education
ILS	Inquiry Learning Spaces
KWTG	Science and Technology Knowledge Center, Gelderland
MINT	Mathematics, Informatics, Natural Science, Technology
OSOS	Open Schools for Open Societies
ReSciTEG	Research Group on Science Education and Technology, University of Cyprus
RRI	Responsible Research and Innovation
SCN	Science Centre Network
STEM	Science, Technology, Engineering, and Mathematics
WKRU	Science Center of Radboud University
WP	Work Package

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Summary

This final report describes the completed dissemination and exploitation activities in the Ark of Inquiry project, updating previous versions of this report with information from the fourth and final year of the project (March 2017 – February 2018) for the promotion and circulation of the shared key messages and objectives of the project and for advertising the Ark of Inquiry platform to the key stakeholders of the project (pupils, teachers, teacher educators, scientists, staff of universities, museums and science centres, and research institutions).

First, the introduction of the report briefly recalls the groundwork around which the principles for dissemination and exploitation were organized, including the targets for dissemination. The document then discusses any changes to the various internal and (primarily) external dissemination and exploitation activities undertaken by the project partners, followed by a short analysis of the cumulative results. Some conclusions on the work achieved towards the stated objectives follow each section.

The document concludes with an analysis of reaching the target audiences and a discussion on the project's vision for the sustainability of the results achieved and risks associated with dissemination. Finally, an overview of the strengths and weaknesses of the all four years of dissemination and exploitation activities is presented.

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1. Introduction

Work Package 7 (WP7) of the Ark of Inquiry project relates to Dissemination. The objective of Deliverable D7.5 is to report on and provide a short analysis of those dissemination and exploitation activities that have taken place during Year 4 of the project. It augments the information provided in Deliverables D7.1 (Report on public website and dissemination materials about Ark of Inquiry), 7.2 (Report of dissemination and exploitation activities for Year 1), 7.3 (Report of dissemination and exploitation activities for Year 2), and 7.4 (Report of dissemination and exploitation activities for Year 3), and concludes with an overall analysis of the cumulative work completed during the lifetime of the project.

Dissemination and exploitation activities of the Ark of Inquiry project have been divided into internal and external dissemination. The main aim of the **internal dissemination** is to coordinate an effective information flow between all individual partners and institutions participating in the project, contributing and providing support to the communications goals, priorities and strategies set for the project. Internal dissemination activities may include, but will not be limited to, the development/use of internal communication tools and templates, the facilitation of regular and ad-hoc meetings for the purposes of sharing information, and the undertaking of regular reports to the donor in order to advance the completion of project deliverables.

The main aim of the **external dissemination** is to support the project through the promotion of commonly-shared key messages of the project and ensure regular information flow to key stakeholders and the general public at national and European levels, including those countries not directly involved in the project. External dissemination activities may include, but are not limited to, participation and organization of national and international workshops and conferences, science contests and fairs, open information days, workshops, science contests for teachers and learners, thematic meetings with external experts, conference presentations and publications in peer-reviewed and general public journals.

As already described in previous deliverables, the dissemination of information surrounding the Ark of Inquiry project is taking place over three distinct yet interrelated phases:

1. Development phase: general promotion of the project itself and its objectives;
2. Piloting phase: expansion of the testing ground into new arenas; and
3. Implementation phase: the marketing or “selling” of the results, tools and techniques used in the Ark of Inquiry project for greater outreach of the project deliverables.

As regards dissemination, Year 1 was fully entrenched in the Development Phase, while Year 2 focused on the Piloting of those efforts. Throughout Years 3 and 4, the project has been fully engaged in the 3rd dissemination phase of “Implementation”, as described in the following sections of this report.

2. Year 4 dissemination and exploitation activities

This section of the report provides a description and analysis of the various dissemination and exploitation activities, internal and external, planned and undertaken during Year 4 of the Ark of Inquiry project (March 2017 – February 2018).

2.1. Internal dissemination and exploitation activities

As stated in previous deliverables, the main aim of internal dissemination activities is to coordinate an effective information flow between all individual partners and institutions participating in the project, contributing and providing support to the communication goals, priorities and strategies set for the project.

In Year 1 of the project, WP7 was tasked to develop a **detailed dissemination plan** describing the relevant activities that the consortium will undertake. The plan has been updated in Year 2 of the project to include the **set of commonly shared key messages** elaborated for each of the target groups identified in the next section of this report. No further updates were made to the dissemination plan in Years 3 and 4.

Various tools and mechanisms have been used to ensure a constant and simple information flow between consortium partners, such as Google Drive, Skype and other existing online communication tools. Due to the specific workload of Y4 Dissemination activities, which prioritized the organization of the Final Conference and the Final Recommendations and Guidelines document (D7.6), no general online WP7 meetings were held during Year 4 of the project. However, two working groups (WG) were set up for each of these two main tasks:

<p>Final Conference WG Lauren Bohatka (UNESCO) Meelis Brikker (UT) Annelies Dickhout (HAN) Margus Pedaste (UT) Philippe Pypaert (UNESCO)</p>

<p>D7.6 WG Emanuele Bardone (UT) Lauren Bohatka (UNESCO) Meelis Brikker (UT) Margus Pedaste (UT)</p>

Both working groups met on a monthly basis, with additional ad-hoc meetings as needed to ensure the timely completion of tasks as outlined in the Gantt chart developed for each.

Online and offline forms for the collecting of data on external dissemination and exploitation activities were updated for Year 4 and used for this report. Regular reminders with embedded links were sent to WP7 listserv members.

Conclusions: Overall, internal dissemination activities functioned very well for WP7. Regular online Skype meetings for WP7 and the creation of the working groups in Year 4 were noted of particular benefit, as were the use of the Google forms for collecting reporting data in a systemized fashion. Although it depends on the nature of the project, it would be recommended for future projects to not wait until Year 2 to identify the target audiences and develop the key messages, so that dissemination materials can be created from the get-go with these in mind, although this was not viewed as a hindrance to this project in any way.

2.2. External dissemination and exploitation activities

As defined in Deliverable D7.2, the main aim of external dissemination and exploitation activities is to support the Ark of Inquiry project through the 1) expression and promotion of commonly shared key messages of the project and 2) ensure regular information flow to key stakeholders and the general public at national and European levels. While varying by project phase, the direct **target audiences for external dissemination** are noted in the DoW as:

- teachers and teacher educators
- scientists (including STEM researchers)
- science centres and museums
- policy-makers
- media and the general public

Indirect target audiences remain to be the pupils and parents, as they are both reached through either the teachers or through the public-at-large.

No specific targets and goals have been set in terms of planned outreach for each target audience, but it has been agreed to regularly monitor how many of each audience the project is reaching through its dissemination activities. A full analysis of the target audiences reached so far is available in section 2.3 of this report.

Conclusions: The identification of target audiences for dissemination ignited a very interesting discussion amongst partners, as there was a small difference in the groupings of the target audiences for either dissemination or implementation as identified in the DoW. While not posing any difficulties for the execution of the planned dissemination and exploitation activities, it could behoove projects to clarify and perhaps simplify such lists to avoid confusion when reporting/discussing.

2.2.1. Dissemination and presentation materials

Under the leadership of UT, a series of dissemination and presentation materials¹ were developed during Year 1 for use by the consortium partners in order to have a unified appearance and “brand” when promoting or discussing the Ark of Inquiry project. Despite being the final year of the project, **new dissemination materials** were also developed in Year 4 of the project, which include both the Final Recommendations and Guidelines document (D7.6) and a revised project leaflet (Appendix 1) that presented an outline of the findings of D7.6 and was designed to have a usefulness beyond the project’s lifetime.

Four (4) editions of the project’s **electronic newsletter** were published in Year 4 of the project, for a total of 12 issues over the lifetime of the project to-date and are available for download on the project’s website². This includes the project’s [final newsletter](#), released in February 2018, which was designed as an online digital magazine, complete with recorded interviews from stakeholders and partners.

Table 1. Reported distribution of all dissemination materials to target audiences in Years 2-4³

Target Audience	Y2	Y3	Y4	TOTAL (Y2+Y3+Y4)
Pupils	399	277	80	756
Teachers & Teacher Educators	11,490	6,788	2,019	20,297
Science & Teacher Education Students	215	303	161	679
Science Centres & Museums	141	43	15	199
Scientists (STEM researchers)	1,481	245	155	1,881
Policy-makers	570	108	538	1,216
Media & General Public	404	1,955	205	2,564
TOTAL	14,700	9,719	3,173	27,592

As illustrated above in Table 1, teachers and teacher educators accounted for the receipt of about 73% of all **dissemination materials distributed throughout the project**, as reported by the partners. Considering that teachers have been identified as the primary target audience of the entire project, this is a positive sign as it indicates that this is where the partners’ main efforts are concentrated. The drop from the beginning of the project to the end is likely due to the fact that a dialogue has since been set up with the local communities and such large, mass distribution of materials isn’t needed any longer.

Nonetheless, partners will continue to disseminate materials from the project after its closure. The Science Center Network Austria, for instance, will promote Ark of Inquiry products in its next newsletter that will be released early March 2018, reaching at least 2,000 persons.

¹ These materials are discussed fully in [Deliverable D7.1](#).

² Previous project newsletters can be downloaded from here: <http://www.arkofinquiry.eu/resources>

³ All dissemination materials, both electronic and in hard copy as discussed in Deliverable D7.1, are considered

Conclusions: The breadth of the available dissemination materials was well-thought out and executed. The development and reinforcement of a strong logo and communication templates was also to be considered a success. Certainly, some dissemination materials were used more than others (such as flyers over business cards) but it was precisely this flexibility that enabled partners to create or adapt the materials in their own languages and contexts for localized successes. As previously stated, there were no targets set per audience for the dissemination of materials, only a monitoring system put in place; from this, the project partners were able to see where they were actually (perhaps unconsciously) putting their efforts, as evidenced by the large gap in dissemination amongst the non-teacher audiences. However, setting such dissemination (not implementation) targets artificially could also disallow the natural orientation of project activities in response to the stakeholders' needs. Thus, in the end, leaving the dissemination targets open as regards quantification could be considered as a positive lesson learned.

2.2.2. Public website and online presence

Complementary to the printed presence assured by the dissemination materials above is the online presence through the **official Ark of Inquiry website**, <https://www.arkofinquiry.eu>, live for the public since 14 March 2014. Designed and managed by the University of Tartu, the website is considered as the main tool for external communication and rapid dissemination of information about the project's objectives, partners, publications, events, related documents and dissemination materials. Drupal, an open source content management platform, is used to manage the website through the OpenScholar system. No major changes were made to the project website in Year 4, other than adding a direct link to the project recommendations on the home page. A snapshot of the latest home page is presented in Figure 1 below.

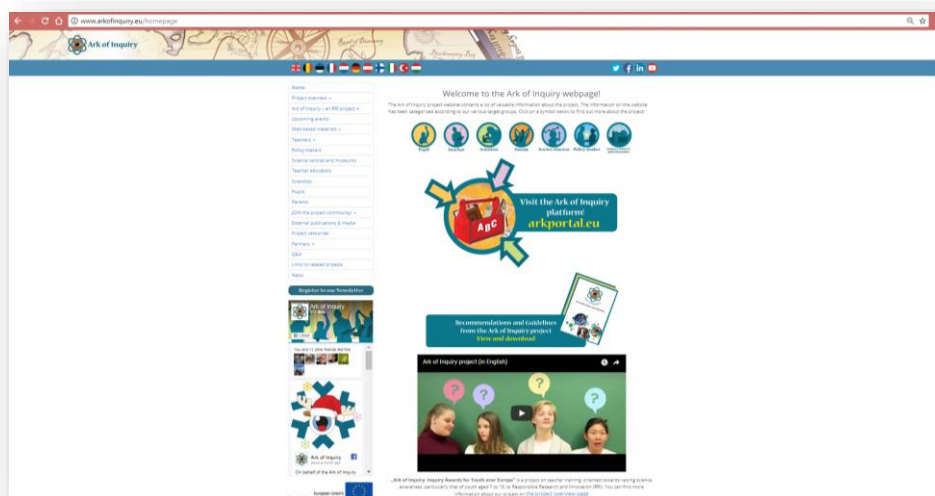


Figure 1. Ark of Inquiry website (<http://www.arkofinquiry.eu>)

Partners have continued to promote the official Ark of Inquiry website through their own **institutional websites**, often as a translation of part or all of the website or by promoting it with a hyperlink. Table 2 below shows the updated statuses of how the partner institutions have promoted the Ark of Inquiry project on their own websites.

Table 2. Status of Ark of Inquiry promotion on consortium partners' websites, Y2-Y3-Y4⁴

Partner	Language	Status	Y2 Page views ⁵	Y3 Page views	Y4 Page views	TOTAL Page views
UT	Estonian, English	Project description included on Centre for Educational Technology workgroup website, with an English version also available	N/A	N/A	967	967
EA	English	Project description included on website	N/A	N/A	N/A	N/A
UTU	English, Finnish	Dedicated project pages in both English and Finnish on the website of the Faculty of Education	N/A	N/A	N/A	N/A
UCY	Greek, English	Project description promoted in both Greek and English on the website of the Research in Science and Technology Education Group (ReSciTEG)	0	N/A	1,977	1,977
UNESCO	English	Dedicated project page of Ark of Inquiry project on Venice Office website	1,763	3,036	1,201	6,000
HAN	Dutch	Dedicated project page on the website of the Research Centre for Quality Learning; additional pages added	224	688	2,031	2,943
BMB	German	A dedicated national Aol Moodle Online Platform with project- and community information, teaching material, and a blended learning training on RRI. Ark of Inquiry is also promoted on the e-Education platform Austria .	1,144	1,097	1,208	3,449
UBER	English	Dedicated project page on the website of the Chemistry research group	50	193	191	434
BEKAS	Turkish	Dedicated website to the project	629	374	1,293	2,296
EADN	French	Dedicated project pages on website	N/A	865	1,159	2,024
UCLL	Dutch	Dedicated project page linked to Ark of Inquiry website	N/A	N/A	137	137
HRTA	Hungarian	Dedicated project page on website	200	425	580	1,205
AHHAA	Estonian	Dedicated project page on website	2,346	236	437	3,019
Totals			6,356	6,914	11,181	24,451

Here one can see that the number of page views that each partner's dedicated website or webpage has received in the past three years reaches well **over 24,000** in addition to those of the project's official channels.

⁴ Website addresses for the above partners' websites are available in Appendix 2 of this report.

⁵ Approximate number of page views since project page or website was created in Y1 or Y2 of the project.

As mentioned in the previous year’s deliverable, one partner, HAN, engaged in a **Google AdWords campaign** from November 2016 until May 2017. People of the target group who searched on Google for ‘Inquiry learning in the classroom’ (in Dutch) would see an advertisement for the Ark of Inquiry training to the right of their results list. The purpose was to get people to the training and this action was deemed very successful by the partner. Most of HAN’s participants in the open trainings came via this campaign, confirmed due to the fact that they came from schools outside the region they normally work for.

In addition to the official Ark of Inquiry website, the project has developed a solid **social media** presence with tools such as Facebook, YouTube, Twitter, and LinkedIn. Facebook pages are accessible in both English and Estonian languages at www.facebook.com/ArkofInquiry and <http://www.facebook.com/uuringulaegas> (see Figure 2 below). 367 and 98 people have “liked” the two pages, respectively, as of 15 January 2018, a steady increase in both over the four years of the project. Forty-seven (47) posts have been made in Year 4 (37 posts to the English page and 10 posts to the Estonian page), a decline from previous years (97 total posts in Year 3, 72 posts in Year 2, and the 24 posts made in Year 1). Only 3 posts were made in Year 4 to the project’s closed Facebook group to share internal information, also significantly reduced from years prior. A possible explanation for this decline is most likely due to partners’ using the account to share information on a less-targeted basis, and then after contacts have been established, used direct communication instead.

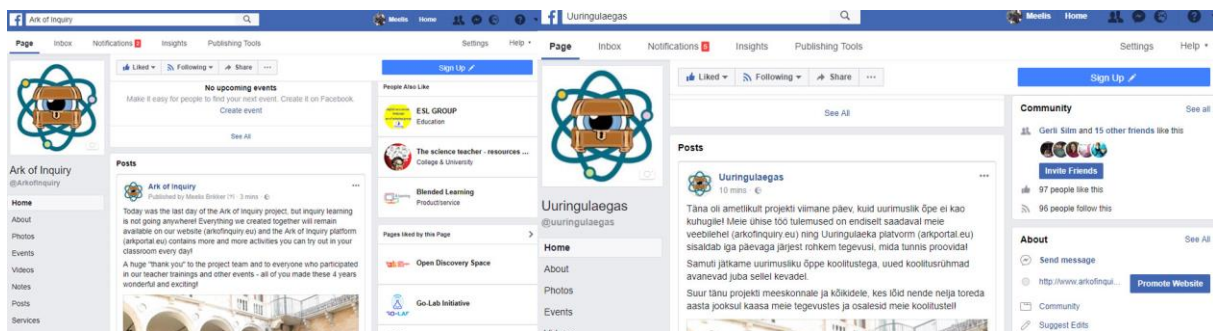


Figure 2. Ark of Inquiry Facebook pages in English and Estonian

Efforts were made in Year 4 to revitalize the use of the project’s Twitter (<https://twitter.com/ArkofInquiry>) and LinkedIn accounts (www.linkedin.com/groups/Ark-Inquiry-Inquiry-Awards-Youth-6921276). In this third year of its existence, the Twitter account made no new tweets but increased its followers to 79. The LinkedIn account had no changes, assumedly due to the project team’s decision to deemphasize it in the past year.

The [YouTube channel](#) set up for the project to disseminate videos both produced by the project and share those produced elsewhere that have an added value for project activities has continued to improve in Year 4. As illustrated in Table 3 below, overall views of the three videos produced by the project has more than doubled from the previous year, from 587 views in Year 2 to 1,382 views in Year 3, to 1,790 views by the end of Year 4. While a strong overall

increase, it is evident from the table that the use of videos as a tool is utilized more in some countries than in others. The channel, however, has only eight subscribers.

Table 3. Number of views per video and language as registered by YouTube⁶

Language/version	General intro to Ark of Inquiry	HRTA video targeting Teachers	Intro to Platform	Total
Original English / no subtitles	6	874	81	961
Original Hungarian / no subtitles		266		266
Dutch subtitles	24	1		5
English subtitles	83			83
Estonian subtitles	13	12		25
Finnish subtitles	7	10		17
French subtitles	0	3		3
German subtitles	36	3		39
Greek subtitles	10	20		30
Hungarian subtitles	46			46
Italian subtitles	91	83	30	204
Turkish subtitles	43	48		91
TOTAL	359	1,310	111	1,790

In addition to the regular videos produced by the project, also uploaded to the project's YouTube channel are the videos from the two UNESCO-organized webinars for teachers in Southeast Europe and the video of the online presentation prepared for the 2016 New Perspectives in Science Education conference. The Scientix-sponsored webinar on 19 December 2017 is available on YouTube as well, but only on Scientix's channel, not the project's. Altogether, these additional four videos (all in English) add a further 180 views, bringing the figure to **1,970 total views on YouTube**. An additional 98 views were made to other videos not produced by the project but shared through the channel.

Google Analytics has been regularly used to monitor **website activity** for the project. As illustrated in Figure 3 on the following page, during the fourth year of operation (1 March 2017 – 17 February 2018), the website registered 6,634 sessions viewed by 4,700 users. Just over 18,000 pages were viewed during those sessions, resulting in an average of 2.74 page views during each session. Each session lasted an average of 2:49 minutes, with only about 14% of all sessions made by returning users, the latter less than half of the previous year.

⁶ As of 30 January 2018

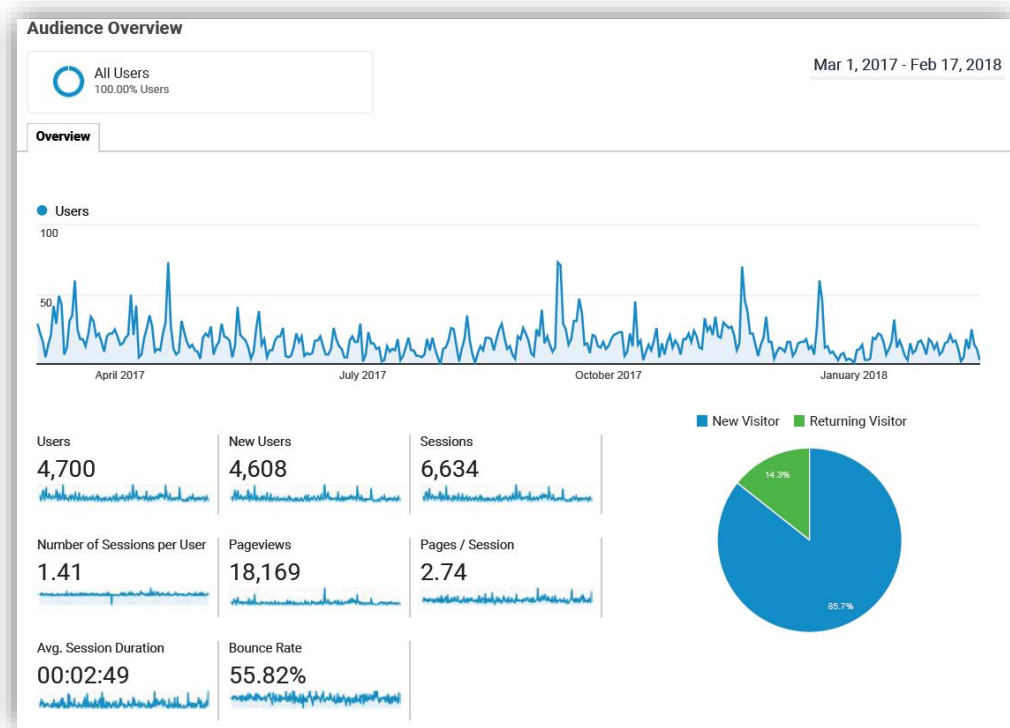


Figure 3. Google Analytics “Audience Overview” report, accessed 17 February 2018

Visitation of the website peaked at around 450 page views in late September 2017, when the schools year had restarted and the dates for the final conference were publicly announced, with around 75 users visiting the site.

As illustrated in Table 4 below, compared with previous years’ activity, Year 4 saw a slight decrease in overall sessions, while the number of users increased by 10%. There was also a corresponding drop in the number of page views by 8% from the previous year, and in the average page views per session and time spent per session. This seems to indicate that more people were visiting the website, perhaps with more targeted intentions, driven perhaps by the teacher trainings and final dissemination activities, as less time was spent looking around the different parts of the website. **Cumulatively, 14,385 users have visited the project website during over 22,600 sessions, resulting in 81,250 page views.** Looking at the entire 4-year period from March 2014-February 2018, the average number of page views per session was 4.04, with users spending an average of 4:05 minutes each session.

Table 4. Website statistics, Years 1-4

Marker	Year 1	Year 2	Year 3	Year 4	Cumulative
# of sessions	3,208	5,973	6,802	6,634	22,617
# of users	1,604	3,737	4,344	4,700	14,385
Page views	22,686	20,660	19,735	18,169	81,250
Ave. page views/session	7.07	3.46	2.90	2.74	4.04
Ave. time spent/session (min)	7:02	3:24	3:04	2:49	4:05

Table 5. Top visited sections of website with ranking, Years 1-4

Website section	Est. Page views	% of total page views	Y1	Y2	Y3	Y4
Home page	4,659	25.64 %	1	1	1	1
Target audience pages	3,742	20.60 %	2	2	2	2
Project overview	1,977	10.88 %	3	3	3	3
Project resources	1,911	10.52 %		5	4	4
RRI	1,745	9.60 %		6	5	5
Web-based materials ⁷	1,037	5.71 %		7	6	6
News	772	4.25 %		4	8	7
Partners	683	3.76 %		10	9	8
Links	400	2.20 %		8	7	9
Upcoming Events	338	1.86 %		N/A	N/A	10
Join project community	257	1.41 %		9	10	11
Totals	17,521	96.43 %				

During the fourth year online, the most visited page within the Ark of Inquiry website was still the home page, with well over a quarter of the total 18,169 page views. The webpages set up for each of the target audiences were the next most visited, representing one-fifth of the total page views. As with prior years, the project overview and project resources webpages were the third and fourth most visited sections on the website respectively, each representing around 10-11% of the total page views; the latter section also included all of the evaluation and assessment tools available online. Interestingly, a newcomer to the top 10 sections of the website is the “Upcoming Events” section, which, available only in English, regrettably has not been updated since the end of Year 3 of the project. This shift may in fact be due more to the decrease of interest in joining the project community in the final year of the project, more so than an increased interest in upcoming events. Table 5 above illustrates the remaining distribution of the page views of the project’s website.

Looking specifically at the target audiences’ pages, the most visited in Year 4 were again those of teachers and teacher educators, as illustrated in Table 6 on the following page. This is consistent with the trends from Years 2 and 3, and reflects the goal of the project to target teachers as the primary target audience, with teacher educators as a key member of the supportive community. Cumulatively, scientists and pupils round out the top four categories, with policy-makers notably coming in last all four years. This is a disappointing result, particularly in the fourth year of the project, when the emphasis shifted a bit towards the continuity and applicability of the results of the project on educational policies. With the final dissemination of the recommendations and guidelines of the project currently in course, perhaps over time these numbers may still yet increase.

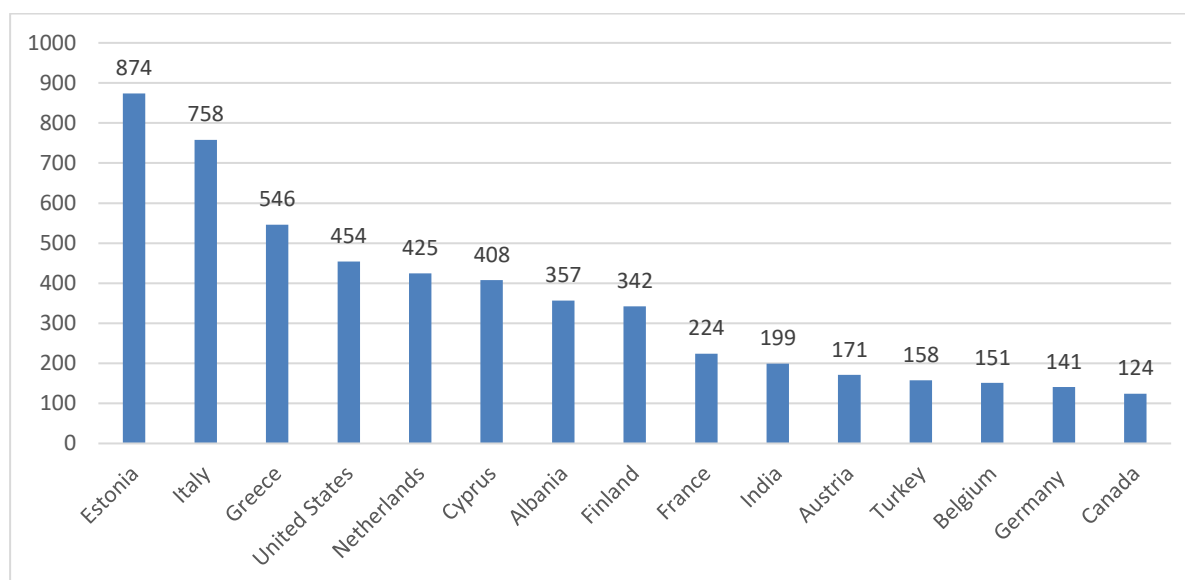
⁷ This website section is available in English only; all others include figures from both English & Estonian versions

Table 6. Page views and percentages per target audience webpage, Years 1-4

Target Audiences' pages	Page views				
	Y1	Y2	Y3	Y4	TOTAL
Teachers	505	1,669	1,440	1,578	5,192
Policy-makers	N/A	113	92	102	307
Science centres & museums	261	451	209	237	1,158
Teacher educators	331	1,500	1,081	1,109	4,021
Scientists	632	543	268	222	1,665
Pupils	452	421	473	263	1,609
Parents	145	347	216	231	939
TOTAL	2,326	5,044	3,779	3,742	14,891

As can be seen in Chart 1 below, considering the number of sessions Estonia is again the top location where users of the project's website were based in Year 4, accounting for 874 of the 6,634 sessions recorded (13.17%). It also hosted the highest number of individual users, 622 users (correspondingly 13.23% of the total 4,700), compared to the United States' 432 users or Italy's 410 users. The rest of the top 15 countries (82% of all sessions made during Year 4) where users are located represent the host countries of the other project partners, with the notable exceptions of the United States, Albania, India, and Canada. Low partner country visitation was registered for Hungary (34th, only 21 sessions). One success was that for the first time, the website was visited by people from all European countries; the only exception was the Republic of Moldova, despite Ministry of Education officials having been directly invited by UNESCO to participate in the online webinars in the 2nd half of 2017.

Chart 1. Top 15 Ark of Inquiry Y4 website user locations by country (by number of sessions)



The statistics also show that of the 6,634 sessions, 3,514 (53%) were conducted from an English-language device, a not insignificant increase compared to the previous three years' analyses which had 42%, 44% and 46% of sessions conducted from an English-language device. The use of Italian-language devices was still the 2nd-most popular, albeit at less than half the percentage from Year 3 (dropped from 18% to 8.5%). Dutch (7.5%) and Greek (6.8%) language

devices round out the top four, with German and Estonian-language devices statistically typing for 5th (4.3%). The high number of devices in these languages corresponds to the user locations as noted in Chart 1 above.

About 81% of sessions were made from a desktop computer, with the remaining 19% made from mobile devices such as a tablet or phone, a further increase over the 17%, 13% and 9% of sessions that used such devices in the previous years, respectively. Around 38% of the mobile device users accessed the website via an Apple product (iPad or iPhone), with the large majority of the remaining visitors using an Android-based device (62%), consistent with past years' data.

Most users accessed the project website from a search engine, such as Google, Bing or Yahoo (around 47%). Another 28.5% accessed the website directly and another 24% referred from the partner websites. A small percentage (2.5%) arrived to the website via social media.

Conclusions: The project's website remained an effective method of communication in the fourth year of the project. The notable gradual decline in page views as the project picked up speed over the last four years, however, while disappointing, does not inherently presume to be caused by a decline in interest by potential audiences. Nonetheless, it is important that continue efforts are made by all partners to ensure that new audiences are continually being reached, in order to maximize the effectiveness of the time, cost and effort spend on maintaining an online presence.

The strong support from the partners' web presence confirmed that having a project website is not enough for effectively reaching national audiences. Facebook, Twitter, could have been used more, particularly in the final year. Channels such as "LinkedIn" could have been better linked to the project, such as from the registration page. Partners could have been perhaps more empowered to post to or tag "ArkofInquiry" in posting online, but it was found that the chosen medium for dissemination also varies by country, so this would not always be effective. Nonetheless, a better plan for the use of social media in particular would be recommended for future projects.

2.2.3. Events

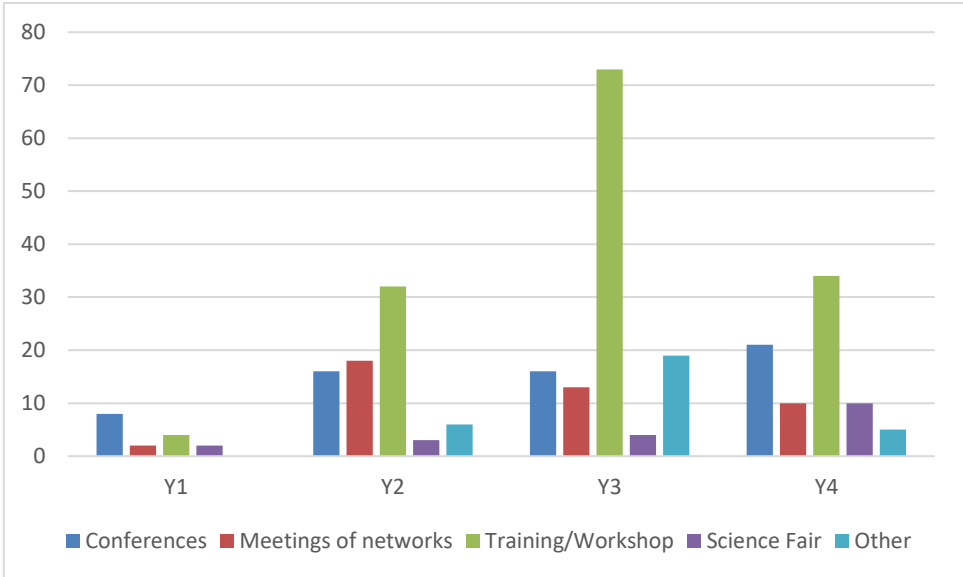
The Ark of Inquiry community encouraged partners to participate in a variety of **scientific and popular events** to disseminate the ideas and outcomes of the project. As noted in Table 7 below, in Year 4, consortium partners participated in 80 events in which the Ark of Inquiry project was promoted or discussed. Trainings/workshops were again the predominant event in Year 4, accounting for 43% of all events and reflecting the final push of the implementation stage of the project as teacher trainings (see WP4 deliverables) also are counted here. Other activities undertaken in Year 4 include conferences, science fairs and meetings of networks.

Table 7. Types of events in which Ark of Inquiry participated in Years 1-4

Type of event	Y1	Y2	Y3	Y4	Total
Conferences	8	16	16	21	61
Meetings of networks	2	18	13	10	43
Training/Workshop	4	32	73	34	143
Science Fair	2	3	4	10	19
Other	0	6	19	5	30
Total	16	75	125	80	296

Looking at the participation in the 296 events reported over the lifetime of the project, as illustrated in Chart 2 below, one can see that training/workshops represent the largest category of events (48%) participated in. This was consistently the lead type of event every year with exception for the first year, when participation in conferences to introduce the project dominated as the project’s training phase had not yet begun. The total number of events peaked in Year 3, at the heart of project implementation, with 42% of all reported dissemination events taking place during this one project year (March 2016-February 2017).

Chart 2. Types of events in which Ark of Inquiry participated (over project lifetime)



As illustrated in Chart 3 and Table 8 below, events are regularly spread out in all of the partner countries over the past four years. While the Netherlands hosted the most events in Year 4 (12), overall Estonia has played the largest host throughout the lifetime of the project, hosting 42 out of 296 total events reported, probably also due to the fact that it is the only country that is home to two partner institutions, UT and AHHA. Twelve events were held outside of the 12 participating partner countries in Year 4, representing conference or training opportunities in Albania, Iceland, Lithuania, New Zealand, Portugal, Thailand, the United Kingdom of Great Britain and the Taiwan Province of China. Three of these events were webinars held exclusively online.

Chart 3. Location of events in which Ark of Inquiry participated (over project lifetime)

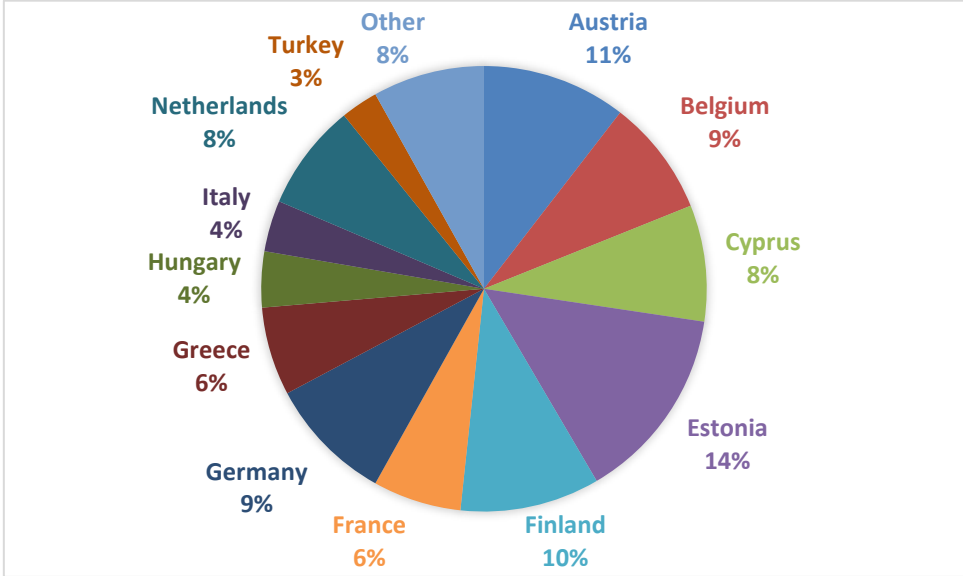


Table 8. Location of events in which Ark of Inquiry participated in Years 1-4

Country	Y1	Y2	Y3	Y4	TOTAL Y1-Y4
Austria	2	7	16	6	31
Belgium	1	3	13	8	25
Cyprus	2	6	9	8	25
Estonia	3	24	8	7	42
Finland	-	5	17	8	30
France	-	6	5	8	19
Germany	1	2	20	4	27
Greece	1	3	11	4	19
Hungary	-	4	6	2	12
Italy	-	3	8	-	11
Netherlands	2	5	4	12	23
Turkey	1	2	4	1	8
Other	3	5	4	12	24
	16	75	125	80	296



Photo 1. Science Fair participant, Finland, May 2017 ©AHHAA

A good example of one of the collaborative **science fairs** organized took place on 30 May 2017, when UTU organised a one-day science fair on the premises of [Heureka Science Centre](#) in Vantaa, Finland, in collaboration with Ark of Inquiry partners UT and AHHAA. The 8 teachers and 10 pupils that took part in the science fair got a rare opportunity to examine authentic pig's heart and lungs and to investigate the properties of DNA from saliva. Pupils and teacher were extremely interested in this opportunity to examine real lungs and heart, especially blowing air to the lungs via a straw, which provided an extremely powerful means to discover how the lungs work and how different the muscles and tissue of the heart and lungs are.



Photo 2. Ark of Inquiry Summer School, Greece, July 2017 ©EA

For the second year in a row, the **Ark of Inquiry summer school** was hosted and run by EA in Greece on 9-14 July 2017. Entitled, “Ark of Inquiry: Creating future responsible citizens through inquiry learning”, the summer school brought together 38 teachers from across Europe and the USA for 5 days in Marathon, Greece. The summer school introduced teachers to the concept of Responsible Research and Innovation (RRI) via a series of practical workshops and theoretical presentations. Pedagogical scenarios and Ark of Inquiry activities were presented to the participants who got the chance to become more familiar with the use

of inquiry-based science teaching techniques and RRI aspects, such as discussing ethical issues in the classrooms, addressing gender equality and connecting the school with the local communities and projects with grand societal challenges.

Not all events took place “physically” in Year 4 – this year the project also hosted three **webinars for science teachers** and other stakeholders to learn more about the project and its findings. The first two (identical) webinars were held on 6 & 21 September 2017, aimed at science teachers of the countries of South-eastern Europe (SEE). Organized by UNESCO with the support of UT, the webinars covered what is IBSE and RRI, the project’s inquiry learning model, access to the platform (arkportal.eu), and other resources that would allow participants to customise these inquiry activities to address diverse learning needs. The 67 individuals participating from SEE and other countries gave positive feedback on the information given and shared their hope and intention to use the ideas and inquiry activities from the platform in their classrooms.

A [third webinar](#) was conducted by the project on 19 December 2017 at the invitation of Scientix, also conducted by UNESCO and UT. Focusing on the recommendations as presented at the project’s Final Conference, this one-time webinar targeted science teachers from all over Europe, offering in a shortened form the same information available in the previous webinars, with the addition of the “takeaways” for teachers as noted in the project’s Final Recommendations and Guidelines document (D7.6), which was launched at the Final Conference. The 85 teachers who participated in this webinar appreciated it very much, noting they would use the guidelines shared as notes to build related lessons and intended to use the inquiry activities in the platform.

Lastly, the most important event for the final year of the project was its **Final Conference**, held 20 November 2017 at UNESCO HQ in Paris, France, for optimal visibility among key, high-level stakeholders. Throughout diverse discussions and panel presentations, the conference presented the project’s key findings as encapsulated in its Final Recommendations and Guidelines document (D7.6) and offered first-hand perspectives on how inquiry learning, RRI and empowering girls in science directly ignite the passion of learning in the next generation of global citizens.

The event was welcomed by Svein Osttveit, Director, Executive Office, on behalf of Qian Tang, UNESCO Assistant Director-General for Education; Ana Luiza M. Thompson-Flores, Director, UNESCO Regional Bureau for Science and Culture in Europe; and, Maria Karamitrou, Policy Officer, European Commission. The opening statement followed by a keynote address on the role of Responsible Research and Innovation (RRI) in Inquiry-Based Science Education (IBSE) made by Ton de Jong, Professor of Instructional Technology at the University of Twente, Faculty of Behavioural Sciences and Head of the Instructional Technology and Educational Sciences departments, Netherlands.

The conference casted a broad spectrum of over 80 participants: from teachers to policy-makers, researchers, EU project coordinators, consortium members and pupils - all of which attended the conference as a testimony of the “EU-project community” speaking with one voice. The conference in particular gave participating teachers from the 12 partner countries their well-deserved visibility with an entire panel based on their experiences regarding the project’s key findings.

Insight was also given on vivid issues that touch education through grand societal changes and hopefully acted as lobby for policy-level changes through the interactive high-level panel discussion based on the six dimensions of RRI (Governance, Gender, Science Education, Open Access, Engagement and Ethics). Other EU projects were presented, highlighting what they had in common with the findings of the Ark of Inquiry project, and a discussion was held on the issues of sustainability of EU projects and how to work better together.

The final recommendations of the project were then presented to the audience targeting teachers, scientists, researchers, and policy-makers, in whose hands education’s future is beheld. The event closed with an evening reception that treated participants to two short performances by the “Mad Scientists”, a leading science enrichment provider for children in kindergarten through to grade 6 in over 20 countries around the world.

Despite being the financial and programmatic closure of the project on 28 February 2018, a number of partners have already committed their own resources to **future dissemination events**. This includes:

- BMB is currently offering a series of webinars to interested teachers in Austria through March 2018. It will promote and distribute Aol resources during its national “[edu-days](#)” in April 2018, when primary and secondary school teachers will discuss and reflect on the use of new technological tools in education. The outcomes of the project will also be presented at the eLearning Experts Conference October 2018 in Eisenstadt, Austria and at the eEducation Austria Fachtagung in Graz, Austria in November 2018. The conferences focus on innovative school projects/pedagogical approaches and on new and innovative pedagogy in Austria, respectively.
- UCY plans to organize a Science Fair at a primary school in Cyprus on 18 March 2018. Also at the end of March they will have teacher trainings to learn how to create inquiry learning spaces in [Graasp](#).
- EA is committed to continue the promotion and implementation of the hugely successful [Eratosthenes Experiment](#) activities that are in the Ark of Inquiry platform and will continue to enhance their RRI element along the project’s recommendations. The activity is planned for the 2018 spring and autumn equinoxes and is expected to attract more than 400 schools from all over the world. Further, given the success of the Ark of Inquiry Summer School in 2017, EA will incorporate the Ark of Inquiry approach that formed the basis for that training event into the new OSOS Summer School, with particular emphasis on the Ark of Inquiry recommendations and how to

best combine IBSE with RRI. Lastly, as far as Greece is concerned and given the appeal of the Ark of Inquiry trainings during the past 4 years, EA is planning to host RRI training events for teachers that will utilise both the Ark of Inquiry framework and platform.

- AHHA is applying the 3-phased training approach in its ongoing courses for in-service teachers, the next of which is foreseen for March 2018, and again in autumn 2018. These courses are anticipated to repeat for the next three years in close collaboration with UT.
- In April 2018, HRTA, under the national project "Broadening the horizon of science teaching and learning in Hungary", will host two webinars addressing gender issues and assessing inquiry skills; both will refer to the Ark of Inquiry teacher resources.
- UTU has an accepted presentation in ITK-päivät, the largest educational conference in Finland, April 12-13, 2018. Here they will present results regarding pupils' situational interest while working on various inquiry activities with data that has been collected from several partner countries (N>2000) during the Ark of Inquiry implementation phase. Ark of Inquiry principles and materials will also be disseminated in future compulsory courses for pre-service teachers at the University of Turku.
- HAN will offer parts of the Ark of Inquiry teacher training to schools in the coming year.

Conclusions: The four years of efforts to participate in various dissemination events can be considered a success. All partners participated and engaged in a variety of activities, and the flow of participation corresponds well to the overall trajectory of project activities. The attempts to diversify communication channels through online webinars and presentations proved successful and would be a practice recommended to be repeated, perhaps even earlier in the project's lifetime, should other such opportunities arise. Another promising result that is not well encapsulated in the figures, is the number of events undertaken jointly by partners has increased over the four years of the project, lending for stronger, more targeted and cost-effective interventions that best disseminate the goals, results and key messages of the project across Europe and beyond.

2.2.4. Collaboration with other European projects

European science- and education-related networks have been identified in the DoW as an important resource for the Ark of Inquiry project, primarily in terms of dissemination but also provide valuable inputs for the execution of project deliverables. The previous deliverable identified a number of European projects and networks that were instrumental to the creation and eventual launching of the Ark of Inquiry project, as well as some possible opportunities for further engagement and collaboration.

In Year 4 of the project, greater efforts were taken to actively engage with [Scientix](#) for dissemination of resources and training opportunities, as well as for the hosting of a webinar sharing the final recommendations of the project. The European project [PARRISE](#) (Promoting Attainment of Responsible Research & Innovation in Science Education) invited Ark of Inquiry to its Final Conference in August 2017, which unfortunately was not possible in the end; however, the invitation itself is evidence of the intended collaboration. Also the European projects [Next-Lab](#), [Hypatia](#), [Nano2All](#) and [Sparks](#) all participated to the Ark of Inquiry's Final Conference in November 2017, which resulted in an active discussion about how such projects could (and should) identify ways of collaboration much earlier on in the project cycle.

Building upon this collaboration in November and the partners' individual efforts, the work of the Ark of Inquiry will also be carried forward into other European projects as follows:

- [Next-Lab](#): UTU will transform some of the inquiry activities from the Ark of Inquiry platform into Inquiry Learning Spaces (ILSs) of Next-Lab. Furthermore, UTU will continue working with some of the Ark of Inquiry teachers in the context of Next-Lab. UT, EA and UCY are also partners in the Next-Lab project.
- [Open Schools for Open Societies \(OSOS\)](#): UTU as national coordinator in Finland will use several Ark of Inquiry activities in the context of OSOS. EA as the OSOS project coordinator will create, utilize and promote an Ark of Inquiry online community in the new Open Schools for Open Societies EU project & portal, where a selection of flagship Ark of Inquiry activities will form the core educational resources of this digital community. EA will strive to engage and invite teachers that are registered in the OSOS portal to join the community and continue their work with the Ark of Inquiry IBSE & RRI approach.
- [Quantum SpinOff](#): UCLL (Belgium national coordinator) will use the platform's inquiry activities and the award system in the three classrooms participating. They will also continue disseminating the Ark of Inquiry platform through their teacher trainings and activities in classes that are organized in the framework of other Flemish and European projects, promoting as well the use of the platform to their pre-service teachers. EA and UT are also partners in the Quantum SpinOff.
- [Modernization of Pedagogical Higher Education by Innovative Teaching Instruments \(MoPED\)](#): UCY will use the training methodology developed for Ark of Inquiry in the new 3-year MoPED project, which is a capacity-building project directed at the modernization of higher education in Ukraine by modernizing curricula for Pedagogical Schools of Ukraine and incorporating new courses of top-notch ICT teaching tools and inquiry methods, such as Ark of Inquiry.
- Daylight Rivers: A new Erasmus+ project started in December 2017 between Turkey (BEKAS) and Italy, it will use the teacher toolbox and activities for the development of pupils' motivation and interests toward science courses.

- Urban Science: HRTA is participating in an Erasmus+ project on science learning for smart cities (2017 - 2020) that will use the Ark of Inquiry evaluation system and inquiry activities, reaching new teachers in Bulgaria, Latvia, Poland and the United Kingdom.

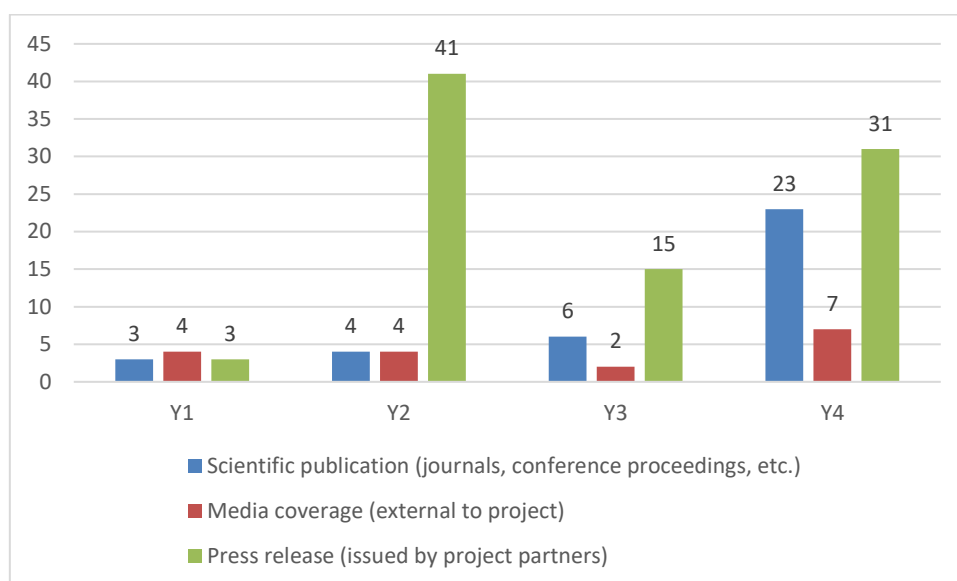
Conclusions: As evidenced above, the Ark of Inquiry project made good progress in its final year to collaborate with other EU projects and networks, also setting the stage for future interventions that will carry the work amassed under Ark of Inquiry forward. However, it remains that such collaborations would be better identified earlier on in the project cycle, if possible, in order to maximize the benefit for both parties.

2.2.5. Publications

Despite the fact that Ark of Inquiry is not a research project, **publications**, from scientific journals to media coverage, are essential for ensuring that the project findings and results are documented for posterity. To this end, the project initially intended to publish in at least ten journals referred to by the Thomson Reuters Web of Science (formerly Thompson ISI Web of Knowledge) database; as this database ended up being quite costly, this requirement was reinterpreted to be “publish at least 10 scholarly articles in peer-reviewed, open access publications”. Additional publications, such as conference proceedings and articles in national scientific journals, were also published during the final phase of dissemination.

The Ark of Inquiry partners issued 61 publications in the project’s fourth and final year, as illustrated in Chart 4 on the following page, an over 100% increase over the previous year’s publication activity. Forty of these publications were at the European or international level (66%) and the rest were at national-level in more than half of the 12 countries. Both scientific publications and press releases/news articles more or less equally dominated the data reported, with also a notable increase in media coverage reported, the latter of which was predominantly at national level. All international and European publications were produced in English.

Chart 4. Publications issued on the Ark of Inquiry project in Years 1-4



Concerning the goal to publish 10 scholarly articles in peer-reviewed, open access publications over the lifetime of the project, two publications were produced in Year 3 and another 21 publications were produced in Year 4, **totalling 23 publications**, more than double the original goal. The project partners have discussed how to build upon this success, with more scholarly or research articles tentatively planned after the administrative closure of the project.

A major milestone to achieve these figures came from the publication of a **special issue of Science Education International**⁸ dedicated solely to the publication of articles from the Ark of Inquiry consortium as emerged from Work Package 5 on Evaluation. More information on this special issue and the scholarly articles it contains can be found in Deliverable D5.4 of the project.

Lastly, a special mention should be made of **Deliverable D7.6 Final Recommendations and Guidelines document**, which, while a planned deliverable of the project, was envisioned and executed to serve also external audiences beyond the donor requirements. The document expands upon the key finding of the project, namely, that for optimal inquiry learning in the classroom, there should be a provision of the right tools, a supportive community, and the application of RRI with the focus of improving participation of both genders.

Regarding future publications, partners have already discussed the possibility of putting together another “special issue” of an academic journal based on additional findings of the project. It is under discussion if these articles, which would be produced at the human and financial cost of the individual partner institutions, would be best served grouped together in a single special issue (if such a journal could be found to encompass all of the aspects the

⁸ Science Education International is the in-house online publication of the International Council of Associations for Science Education (ICASE) - <http://www.icaseonline.net/seiweb>

group wishes to write about), or if they should pursue separate journals that are tailored to each aspect of interest. It is additionally proposed to produce a more technical-level “how-to” article, aimed at teachers, which could then be translated into the partner languages and submitted to national-level trade publications, directly reaching the project’s primary target group of in-service science teachers.

Conclusions: In sum, the opportunity provided by the special issue in Science Education International could not be undervalued in terms of reaching the intended goal and the subsequent intended academic audiences. A recommended best practice for other projects to consider.

2.3. Analysis of Year 4 and cumulative dissemination activities

As stated in previous WP7 deliverables, the implementation targets of the Ark of Inquiry project and the dissemination target audiences slightly differ; thus, it was agreed not to identify target figures for the dissemination target audiences, just to periodically track and review where that dissemination is made. Taking into consideration all of the various sources of information available, this review for Year 4 is presented in Table 9 below. (NB: N/A indicates no data or not enough data is available.)

Table 9. Year 4 indicative progress towards reaching target audiences

Type of activity	Pupils	Teachers & Teacher educators	Science & teacher education students	Science centres & museums	Scientists (STEM researchers)	Policy-makers	Media & General Public	Total
Dissemination Materials	80	2,019	161	15	155	538	205	3,173
Website	263	2,687	N/A	237	222	102	231	3,742
Events & Networks	2,556	2,109	818	1,146	511	216	226	7,582
Publications	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Totals	3,038	8,039	1,071	1,452	939	976	682	16,197

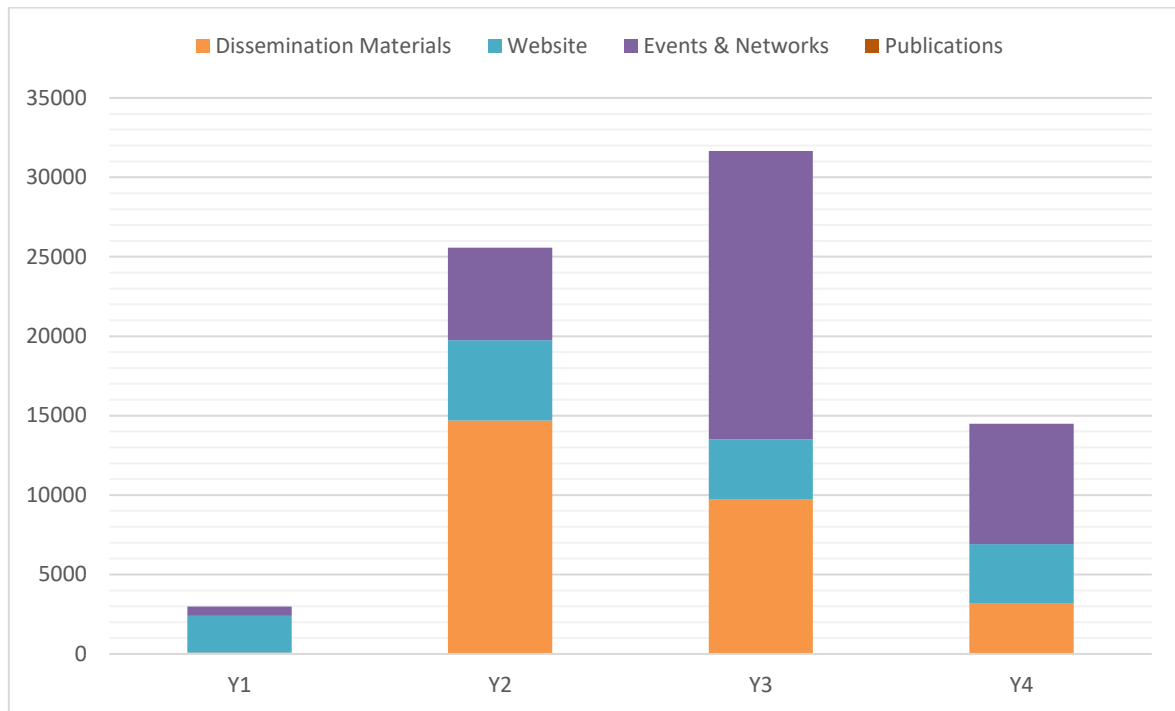
As evidenced above, **the project has reached the relevant target audiences over 16,000 times in Year 4**, with the greatest contribution coming from the documented events and networking activities. Consistently the teachers and teacher educators are the most approached in terms of dissemination. Below in Table 10 can be seen the **cumulative dissemination and exploitation activities of the project⁹, which reached the target audiences a minimum of 76,560 times.**

Table 10. Cumulative, indicative progress towards reaching target audiences

Type of activity	Pupils	Teachers & Teacher educators	Science & teacher education students	Science centres & museums	Scientists (STEM researchers)	Policy-makers	Media & General Public	Total
Dissemination Materials	756	20,377	679	199	1,881	1,216	2,564	27,672
Website	1,609	8,963	250	1,313	1,665	307	939	15,046
Events & Networks	10,696	9,282	2,210	4,492	2,931	748	3,483	33,842
Publications	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Totals	13,061	38,622	3,139	6,004	6,477	2,271	6,986	76,560

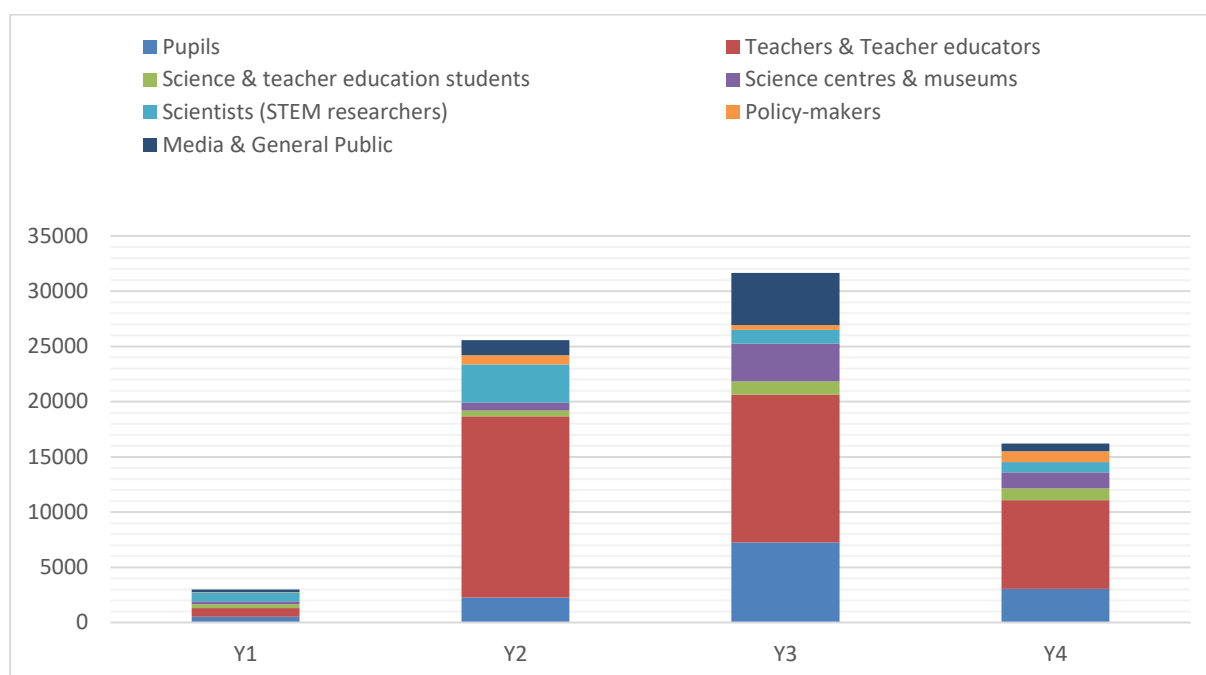
⁹ No tables and charts in this section account for any duplication that may have taken place; thus, figures are *only indicative* of the project's breadth and depth of dissemination and exploitation activities.

Chart 5. Cumulative dissemination and exploitation by type of tool (Years 1-4)



In Chart 5 it is clear to see that partners are making a good use of all of the dissemination tools available. Events/networking opportunities seems to have been the most used dissemination tool in both Year 4 and overall, while the use of dissemination materials has slowly tapered off year by year. As noted in previous deliverables, it is difficult to track the dissemination efforts of publications so it left empty in these charts. In Chart 6 below, it is clear to see that as discussed already in previous sections of this report, the project has been consistently targeting primarily teachers and teacher educators through its activities.

Chart 6. Cumulative dissemination and exploitation by target audience (Years 1-4)

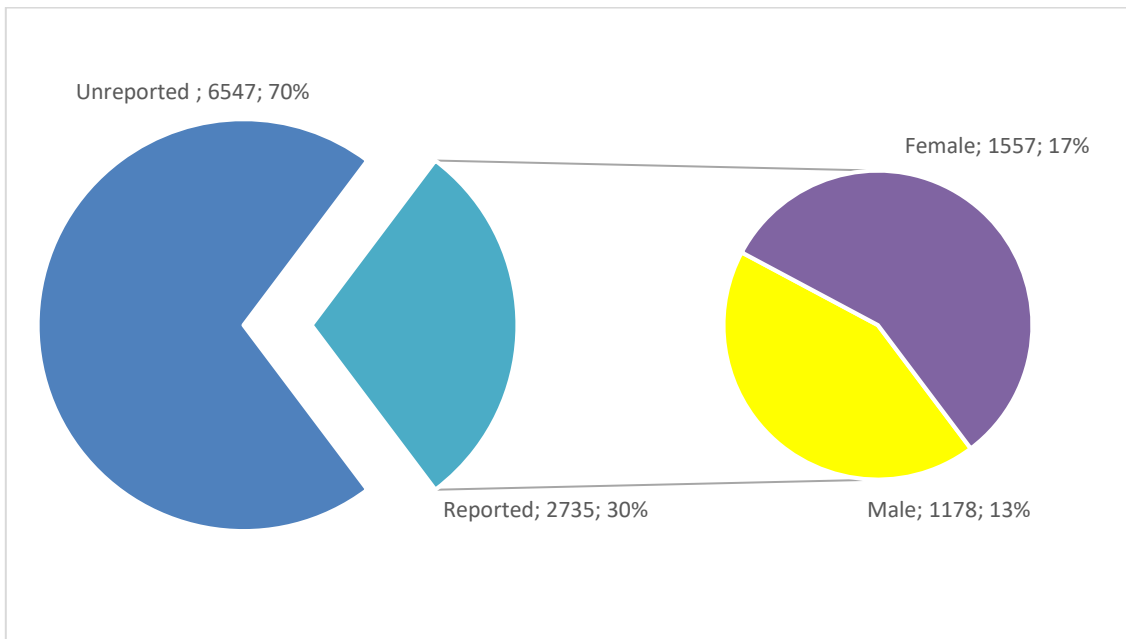


It should be noted that the above representations exclude any outreach from large events where participation is mixed and difficult to tabulate. For example, in Year 1 it was estimated that there were at least an additional 1,000 individuals reached at events; in Years 2 and 3, only a couple events reported each year did not include estimations and/or the breakdown for the target audiences reached (additional figures unknown). In addition, the cumulative 24,451 website visitors to the partners’ websites, as reported in Table 2 on page 13, cannot be broken down into the various target audiences, nor can the 1,790 views of the project’s videos on YouTube. Therefore, the **total number of times individuals were reached through dissemination and exploitation activities, during all four years of the Ark of Inquiry project (not counting for any overlap), is 103,801.**

The consortium partners have paid particular attention to avoiding any **gender gap** in project activities, and this includes the dissemination of information as well. While partners are asked to report on the gender dimension in their activities, this is not always easy: at an event, it could be rather easy to get a list of participants; but for other tools such as publications, unless there is a face-to-face encounter, there is no way to tabulate this information. Thus, other than for events, gender outreach remains a challenging dimension to track.

Of the 9,282 participants reported as reached via events or networks in Year 4, only 2,735 of those (30%) had the gender element reported, a proportion similar to past years’ reporting. Of these, there appears to be again a slight preference for women (56.9%) over men (43.1%), as illustrated in Chart 7 below, also very similar to Year 3 reporting. Assuming that for the rest of the events and networking opportunities (where gender wasn’t reported) participation again averaged at 50/50 between male and female participants, this division appears to have remained roughly the same over four years of continuous reporting, with a slight preference for female participants (52%).

Chart 7. Year 4 gender representation in events and networks



2.4. Sustainability and risk analysis of dissemination activities

As mentioned in previous versions of this annual report, the aspect of sustainability of dissemination actions should not be overlooked but best incorporated from the beginning of every project. Ark of Inquiry is no different, and as a result, a number of opportunities to help sustain the project results are moving forward.

For one, the project's online platform of activities (arkportal.eu) and its website (www.arkofinquiry.eu) will both remain active and maintained for at least five years past the end of the project, as committed by the project coordinator, UT. Partner institutions' websites will also remain online for varying amounts of time, continuing their work to help direct newly interested parties to the work of the Ark of Inquiry project. National-level coordinators have also recommitted themselves to helping maintain their national-level communities, converting new teacher accounts and providing periodic monitoring of new activities in their country language.

A number of one-off or recurring events have been foreseen that will continue to build upon the work of the Ark of Inquiry project, as already enumerated in section 2.2.3 of this report. It is hopeful that the one-time activities may as a result of their anticipated successes also become recurring activities in the end. Same goes for the additional special journal issue and article for teachers as discussed in section 2.2.4 devoted to Publications.

At an international level, UNESCO is preparing an “electronic info package” with e-letter signed by project coordinator that will introduce the project which will be circulated to other Science and/or Education UNESCO offices, institutes and university chairs around the globe, such as the ones identified in Annex 7 of Deliverable D7.4. Such an “info package” could also be shared with other interested parties, too.

At the national level, each partner has envisioned and committed themselves to a number of activities, dissemination and otherwise, that build upon the work they have undertaken and produced under the Ark of Inquiry project:

- UT: The Ark of Inquiry training methodology has been integrated into their courses for pre-service teachers, where students are encouraged to make use of the Ark of Inquiry platform for inspiration in designing their own activities. It is also applying the Ark of Inquiry 3-phased training approach to its courses offered for in-service teachers, which is envisioned to continue for another 3 years. They have also committed to continue to add activities to the platform and will, as mentioned above, financially and technically support the project’s platform and website for at least five years, adding also new activity domains and a Hall of Fame.
- EA: EA will continue working with the teachers trained under the Ark of Inquiry project through its other projects and activities, such as OSOS and the Eratosthenes Experiment, where a selection of flagship Ark of Inquiry activities will form the core educational resources of the former. Additional training events for in-service teachers are foreseen, as well as their successful annual summer school, which will build upon the success of last year’s session devoted exclusively to Ark of Inquiry methodology.
- UTU: Ark of Inquiry resources are already used in pre-service teacher training courses, and future PhD candidates that worked on the project intend to bring with them to their next universities the resources and lessons learned from the project implementation itself. Information is also being promoted in Finland through local Facebook groups and in university teacher magazines. Cooperation with the teacher networks built via the project will systemically continue.
- UCY: Pre-service and in-service teacher courses at UCY fully incorporate the 3-phased training approach developed in the Ark of Inquiry project. The project’s results and activities will continue to be promoted in national-level science fairs and disseminated through teacher networks, particularly targeting teachers at the middle school level who seem to have the greatest need for new, good activities. UCY is ready to provide training to additional schools upon invitation.
- UNESCO: Efforts have been made to cross-promote the Ark of Inquiry project with other UNESCO activities, such as Ocean Literacy and through its Associated School Project network (ASPnet). In Italy, the National Association of Teachers in Natural Sciences (ANISN) has incorporated many aspects of the training methodology into their own activities, and will continue to encourage teachers in their network to use and add to the activities in the platform. In Albania, an expansion country, the national focal

point for the project is located within the Ministry of Education, well-positioned to encourage teachers to make use of the online resources.

- HAN: HAN has contacts with two organizations in the Netherlands that do many activities with schools on topics of science and technology: WKRU of Radboud University in Nijmegen and KWTG in Gelderland. Both are interested to use the tools and elements of the Ark of Inquiry training. Elements of the training will also be used in 2018 in workshops for primary schools.
- BMB: On the Ministry's own platform, there is an online course based on the Ark of Inquiry methodology that is available for free. A series of webinars is also being offered to interested teachers in Austria through March 2018. It is promoting AoI resources at the national-level events of the Science Center Network (SCN) in April 2018, and the Ministry will present the results of the project at its national education conference to be held later in 2018. The teachers trained in the project also report that they are continuing to use the activities from the portal in their classrooms.
- UBER: While it is difficult to affect change in education policies in Germany, the partner is nonetheless committed to offering science fairs and events that will allow classes the opportunity to take advantage of the Ark of Inquiry's resources. They are also actively searching for more schools to come use their lab for teacher training.
- BEKAS: Two courses (school experience and school implementation) taught at Dokuz Eylül University will take advantage of the Ark of Inquiry resources in the platform, as well as 4th grade pre-service teachers will use it as a part of their training. "Instructional Technologies and Material Design" and "Science Education Programming and Planning" courses will use the Ark of Inquiry platform as one of the sources of the courses. The national mailing list used under the project is planned for continuous use for over 17,000 schools in Turkey. The 130 of these schools that are part of BEKAS will use the Ark of Inquiry platform to find IBSE activities for their pupils.
- EADN: The EADN network makes many references to the Ark of Inquiry platform of activities in its teacher training courses and was asked by the French Ministry of Education to continue their trainings into 2019. PhD students from the University of Montpellier are also currently using the Ark of Inquiry resources for their Dissertations.
- UCLL: The main activities for the coming months will be related to the Quantum SpinOff trajectory: currently there are three classes of pupils participating, each with one researcher per class. They will continue performing activities on the Ark of Inquiry platform related to Quantum SpinOff. Afterwards they will work on their final Quantum SpinOff report (due 18 May) and based on this final report will be assigned Inquiry Awards. UCLL will continue disseminating the Ark of Inquiry platform through its teacher trainings and activities in classes that it organizes in the framework of other Flemish and European projects and to suggest the use of the platform to its teacher students.

- HRTA: HRTA will continue to advocate the use Ark of Inquiry materials across its broad network of 300 members and about 700 other educators, both on its website and through its ongoing national and European projects, including also the Ark of Inquiry's gender-focused materials in webinars and in the summer camp for pupils.
- AHHA: The Science Centre AHHA is applying the Ark of Inquiry 3-phased training approach to its courses for in-service teachers, which are envisioned to continue for another 3 years in close cooperation with UT. AHHA will also continue developing the inquiry-learning based activity roadmaps, originally created as part of the Ark of Inquiry project.

Conclusions: It is heartening to see all of the various ways that individually the project partners have been able to sustain and in many cases integrate the results and elements of the Ark of Inquiry project into their ongoing activities, many times at their own human and financial cost. It is further encouraging to note that a number of partners are willing to commit to continue working together, outside any EU project, to further disseminate the results of the project through activities or publications. This level of commitment could clearly not have been predicted nor anticipated at the beginning of the project, as it truly depended upon the final outcomes of the project, to which all partners jointly contributed. As the proposed sustainability actions are based on the evidence of the project's success, it is safe to assume that the risk of them not being fully executed is quite low.

3. Conclusion

The final year of the Ark of Inquiry project was a fitting conclusion to the past four years of dissemination and exploitation activity. Ideas and plans became concretized into reality in the form of publications, events and new, forward-looking dissemination materials. Collaboration and contributions from all partners was made, not just in the final year of the project, but throughout the past four years. A very real effort was made by the WP7 leader, UNESCO, to not only stimulate such cooperation over the years, but also to in turn highlight these achievements in each of the four iterations of this deliverable, giving the much due visibility to the incredible efforts each partner has made on their own, combining into the collective dissemination efforts of the project as a whole.

From this experience, it is clear that each partner, including the project coordinator, UT, made varying degrees of use of the different dissemination modalities available to them – this depended in part on the nature of the national-level communication landscapes but also upon the individuals responsible for each partner. This demonstrates the importance of a well-balanced consortium, not just for the project implementation but also for this very real aspect of communicating the project's progress and successes.

It was known from the start of the project that the figures tallied for the implementation deliverables and the dissemination deliverables would not match, but would hopefully be reflective of one another in the end. Different methods of capturing this information were used and the project is pleased to note that there are no major discrepancies in the reaching of these target audiences. Certainly new projects that may emerge from the findings and results of the Ark of Inquiry project that may wish to take up addressing where any notable gaps have been. But all in all, it is evident to the WP7 leader writing this (and hopefully the reader also) that a great effort was made by the project to reach all of the intended audiences, and this effort was met with an astounding success, reaching the targeted audiences over 100,000 times over the course of four years.

Appendix 1: Revised project flyer

Flyer is presented below and available at

https://sisu.ut.ee/sites/default/files/ark/files/ark_of_inquiry_brochure_2017_2.pdf



ARK OF INQUIRY

"Ark of Inquiry: Inquiry Awards for Youth over Europe" project (project number: 612252) aims to promote youth awareness of RRI and increase their interest towards science as a topic and as an interesting career choice.

Through the Ark of Inquiry, a community of teachers, scientists, teacher educators, science and teacher education students from all over Europe are coming together in order to provide pupils with a way to identify and strengthen their scientific inquiry skills. By doing so, increase their understanding and appreciation of the scientific method and to prepare them to actively participate in and contribute to the European research and innovation process and society at-large.

OUR MISSION AND OBJECTIVES

The overall aim of the Ark of Inquiry project is to change the way the pupils learn science and to provide more challenging, authentic higher-order learning experiences and more opportunities for pupils to participate in scientific practices and tasks, using the discourse of science and working with scientific representations and tools. The project has met this aim by:

- Developing a **pedagogical framework** for identifying inquiry-based activities that promote pupils' awareness of RRI and RRI-related inquiry practices in schools;
- Collecting and maintaining a **repository of inquiry-based activities** and environments from various national and international projects;
- Ensuring the availability of inquiry-based activities across Europe through the **Ark of Inquiry portal** (arkportal.eu);
- Training and forming a **supportive community** of more than 1,100 teachers to promote pupils' inquiry based activities in a manner that attracts pupils' interest and motivation towards RRI in the field of Science; and,
- Continuously implementing and developing the project on a large scale across Europe and disseminating findings.

NEXT STEPS

The portal will continue to exist after the official end of the project in February 2018, offering the portal to serve as a platform of continuous support in inquiry-based learning to pupils, teachers, and other educational professionals.

The Ark of Inquiry project's Final Recommendations and Guidelines document (published Nov 2017) also contains detailed information on the outcomes of the project and specific steps each of the below stakeholders can take to help realize the vision of a "new science classroom" in Europe:

- Teachers of Science and Science Teacher Societies
- National Educational Authorities and Policy-makers
- Teacher Educators
- Scientists and Researchers
- Science Centers and Museums
- Parents
- Pupils

KEY MESSAGES

For successful learning through the use of inquiry skills in the classroom to succeed, there should be a provision of the right tools, a supportive community (including training) and the application of RRI, resulting in the following three Key Messages.

1. TOOLS

We have collected evidence that pupils perceive inquiry activities as highly interesting. Having the right tools would allow for teachers to consistently use techniques that foster inquiry skills with their pupils.

- Involving pupils in their own evaluation motivates, challenges and further invests both teachers and pupils in the process of scientific inquiry.
- The repository of inquiry activities creates opportunities, both formal and informal, to promote a multi-faceted and enriching learning experience; and,
- Pedagogical scenarios help teachers maintain an active role as designers of inquiry learning activities, thereby encouraging autonomy and empowerment.

2. SUPPORTIVE COMMUNITY

A large community consisting of 1100 trained teachers, 100 science and teacher education students and 50 staff members of science centres and museums, universities and research centres across Europe.

The Ark of Inquiry portal acts as a platform to strengthen the community by:

- Allowing for a collaboration between various actors (parents, peers, teachers, researchers, etc.) to help use RRI and Inquiry-based learning in and out of the class;

As designers of inquiry activities, teachers are empowered to create learning spaces that are sensitive to contexts, cultures and gender.

- With the right training, teachers will have a greater understanding of how to apply inquiry learning in the classroom.

3. RESPONSIBLE RESEARCH AND INNOVATION (RRI)

RRI complements the inquiry learning process through reflection, communication and discussion.

The Ark of Inquiry project aims at fostering RRI by:

- Encouraging pupils to take ownership of their own learning, through questioning, reflection and discussion.
- Engaging girls in science
- Critically reasoning ethical dilemmas and issues of sustainability
- Integrating important global matters into classroom materials.

Visit the Ark of Inquiry platform! arkportal.eu

European Union's Seventh Framework Programme

www.arkofinquiry.eu

Appendix 2: List of partner website addresses

Beneficiary short name	Web address where the Ark of Inquiry project is currently promoted on the partner website	Language(s)
UT	http://haridustehnologia.ut.ee/	Estonian, English
EA	http://www.ea.gr/ea/main.asp?id=602&proID=20100108133311&lag=en	English
UTU	http://www.utu.fi/en/units/edu/research/highlights/flagshipresearchprojects/Ark-of-Inquiry/Pages/home.aspx	English, Finnish
UCY	http://www.ucy.ac.cy/resciteg/en/research/research-programmes	English, Greek
UNESCO	http://www.unesco.org/new/en/venice/resources-services/host-facilities/special-events/ark-of-inquiry/	English
HAN	http://www.han.nl/onderzoek/werkveld/projecten/ark-of-inquiry/	Dutch
BMB	https://eeducation.at/ http://www2.lernplattform.schule.at/vis/course/view.php?id=51	German
UBER	http://www.tiemann-education.de/forschung/ark-of-inquiry/	English
BEKAS	http://www.bekas-aoi.org/	Turkish
EADN	http://www.ecole-adn.fr/?page_id=991	French
UCLL	http://www.vakdidactiek.be/ark_of_inquiry	Dutch
HRTA	http://www.kuttanar.hu/ark-inquiry-0	Hungarian
AHHAA	http://www.ahhaa.ee/meist/ahhaa-projektid/uuringulaegas-ark-of-inquiry	Estonian