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Participatory Engagement with Scientific and Technological
Research through Performance

Periodic Technical Report

Part B

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Contents

1.	Explanation of the work carried out by the beneficiaries and overview of the progress	4
1.1	Objectives	5
1.2	Explanation of the work carried per WP	6
1.2.1	Work Package 1 (WP1): Project coordination and management	6
1.2.2	Work Package 2 (WP2): Innovative science education methods based on performing arts	8
1.2.3	Work Package 3 (WP3): Building science education and communication capacity for teachers and early career researchers	13
1.2.4	Work Package 4 (WP4): Impact assessment of the participatory educational process in students' engagement in and learning about science	16
1.2.5	Work Package 5 (WP5): Sustainability and Policy Impact	23
1.2.6	Work Package 6 (WP6): Dissemination and Outreach	24
1.2.7	Work Package 7 (WP7): Ethics requirements	28
1.3	Impact	28
2.	Update of the plan for exploitation and dissemination of result (if applicable)	29
3.	Update of the data management plan (if applicable)	31
4.	Follow-up of recommendations and comments from previous review(s) (if applicable)	31
5.	Deviations from Annex 1 and Annex 2 (if applicable)	32
5.1	Tasks	32
5.2	Use of resources	32
5.2.1	Unforeseen subcontracting (if applicable)	32
5.2.2	Unforeseen use of in kind contribution from third party against payment or free of charges (if applicable)	32

List of acronyms

AB:	Advisory Board
AJA:	L'Atelier des Jours À venir
CSC:	Case Study Coordinators
CT:	Coordination Team
DoA:	Document of Action
EC:	European Commission
ECR:	Early Career Researchers
EUSEA:	European Science Events Association
EW:	Exploratory Workshops
GA:	Grant Agreement
GenA:	General Assembly
ICT:	Information and Communication Technology
LAC:	Les Atomes Crochus
MoE:	Ministries of Education
PERSEIAS:	Performance-based Science Education and Innovation Activities
PEST:	Performers ECR Science communicator and Teacher
PO:	Project Officer
PW:	Participatory Workshops
RRI:	Responsible Research and Innovation
SC:	Steering Committee
SMS:	Science Made Simple
STEM:	Science, Technology, Engineering, Mathematics
STEAM:	Science, Technology, Engineering, Arts, Mathematics
TBVT:	The Big Van Theory
TRACES:	Théories et Réflexions sur l'Apprendre, la Communication et l'Éducation Scientifiques
UAB:	Universitat Autònoma de Barcelona
UNESCO:	United Nations Educational, Scientific and Cultural Organization
UoB:	University of Bristol
UOC:	Universitat Oberta de Catalunya
UoW:	University of Warwick
WP:	Work Package

1. Explanation of the work carried out by the beneficiaries and overview of the progress

During the reported period (Month 16 to Month 24, M16-M24), the PERFORM consortium kept generating results towards the **PERFORM overall objective** of investigating how the establishment of a direct interaction between students and researchers by using performing arts methods for science education impacts on students' motivation and interest towards science, technology, engineering, and mathematics (STEM). The positive progress of the project in this direction was confirmed by the highly positive mid-term assessment produced by the Advisory Board (AB).

Exploitable results included the development of a protocol to transform learning activities combining arts and science into **performance-based science education and innovation activities (henceforth PERSEIAs)** addressing the human dimension of science and the Responsible Research and Innovation (RRI) values. Our consortium generated another result related to the impact assessment: a battery of **indicators to assess RRI values in science education published in open access in an international journal**.

Further, the PERFORM project completed the **first phase of a participatory educational process with secondary school students, teachers and early career researchers (ECR)** that will guide students to generate new PERSEIAs during 2018. This process consisted of a series of workshops that were evaluated according to the above mentioned indicators to assess potential changes in students' attitudes, knowledge and perceptions towards science, their acquisition of the transversal competences needed to pursue STEM careers, and the inclusion of the values of the RRI approach, with a special emphasis on girls. Taking into consideration the results of this evaluation, this process is currently being redefined in each case study. Moreover, in this process, students used social media tools to interact with researchers. As a result of such interaction, an Information and Communication Technology (ICT) automated tool to enable social media data analysis was developed.

Our consortium also developed **trainings for early career researchers (ECR)** in UK, France and Spain, as well as implemented a **pilot training addressed to secondary school teachers** in Spain, to equip them with the tools to improve their skills on science communication, performance and reflexivity.

Furthermore, considerable effort was put into management as well as dissemination and communication actions, ensuring an effective technical progress and use of resources of the project, and the timely transference of the newly generated knowledge to the scientific and education communities across Europe through **online and offline communication tools and platforms**, including **Scientix and policy events**.

In sum, **two deliverables** and **one milestone** were successfully achieved (Table 1) and **two exploitable results were generated** (Table 2) in line with the Annex 1 of the Grant Agreement (GA).

Table 1. Deliverables approved and milestones achieved in reporting period M16-M24.

WP no.	Del./ Mil.	Deliverable/Milestone name	Lead beneficiary	Peer-reviewed by	Delivery Month
WP1	D1.3	Evaluation Report of the Advisory Board	UOC	UNESCO, LAC	24
WP2	D2.1	Final protocol of tested methods to transform a performance-based activity	TBVT	UoB, UoW, UOC	16

		into a PERSEIA			
WP4	M4	ICT development of an automated tool to enable social media data analysis	UoW	UOC	24

Table 2. Summary of the exploitable results generated in reporting period M16-M24.

WP no.	Exploitable result	Involved beneficiaries	Means for current and further exploitation
WP2	Final protocol of tested methods to generate a PERSEIA	TBVT	Publication at PERFORM website and social media (including videos)
WP4	Scientific article: <i>'Responsible Research and Innovation Indicators for Science Education Assessment: How to Measure the Impact?'</i> International Journal of Science Education (Q1, IF:1,85).	UAB, UOC	Gold open access publication Publication at PERFORM website and social media (including videos)

1.1 Objectives

In this reporting period, our consortium conducted work towards the achievement of the four specific objectives listed in the PERFORM Document of Action (DoA), as follows:

Objective 1. To explore new science education methods based on scenic arts that lead secondary school students to understand and to learn about STEM

PERFORM contributed to this objective through **the delivery of a protocol of tested methods to generate a PERSEIA (M16)**, which is currently (Month 25) being transformed into a user-friendly toolkit. This toolkit includes videos and short documents to make it easier to read the deliverable and is available at the PERFORM website.

Furthermore, **the first phase of a participatory process was carried out** with secondary school students, their teachers and ECRs in the three case studies, which guided participant students to generate their own PERSEIAs. This process consisted of a series of participatory workshops (PW) based on an inquiry-based learning approach, and tested in 5 secondary schools in Barcelona, Bristol and Paris. These PW are currently being redefined in each case study following the recommendations of the impact assessment as well as the suggestions of the AB.

Objective 2. To identify and challenge limitations faced by secondary school teachers and early career researchers in teaching and communicating STEM to young people

Within this objective **the ECR training delivered in the first phase of the project was assessed and reviewed**, in order to address both the needs of ECRs and the project in the training in the second phase. The first teacher training took place in Barcelona and the evaluation undertaken on it informed the teacher training design being developed in France and the UK. In addition, the feedback from the AB was, in particular, helpful for thinking about the toolkit resources for both trainings (i.e., teachers and ECR) that will be produced in the following months, and influenced the design and targeting of those resources to ensure that they are highly effective and well used by our peers in the researcher development and teacher training sectors, as well as by interested individuals.

Objective 3. To assess the impact of the participatory educational process in fostering secondary school students' motivations and engagement in science and with RRI values

PERFORM contributed to this objective by **implementing the designed assessment instruments** in secondary schools participating in the participatory workshops. The analysis of all these data generated **four internal reports for each case study**, each report corresponding to one of the four implementation goals of the PERSEIAs and including specific recommendations for the redesign of the workshops. Based on the insights and reflections generated during the first round of PW, as well as on the feedback received from the AB, **the assessment strategy and tools** to be implemented during the second round of workshops **is being refined**.

Finally, within this objective PERFORM also started data collection parameters for **social media data harvesting** on relevant online platforms to evaluate the feelings, perceptions and attitudes towards science and scientific careers of participant students.

Objective 4. To implement a sound communication strategy for the dissemination and exploitation of the research results for widespread policy adoption and implementation across Europe

To reach this goal, our consortium undertook actions for fostering both **dissemination and policy impact**. In this period partners conducted a collective effort to present the PERFORM project in a wide set of national and international contexts through their participation in **11 national, European and international conferences, meetings and activities** on STEM education, RRI and/or science communication for dissemination purposes. Two of these events were linked to Scientix.

Also in this period, the consortium started discussions to plan the final conference of the project that will be a two-day open event at UNESCO Headquarters in Paris.

1.2 Explanation of the work carried per WP

1.2.1 Work Package 1 (WP1): Project coordination and management

As WP1 leader, **UOC** coordinated both research and financial activities of the project according to the rules stated in the GA, providing support to other partners when needed. **UOC** also facilitated communication among consortium members through promoting the use of the intranet and organizing face-to-face and on-line meetings for coordination purposes. **UOC** also organized the external review meeting with the EC Project Officer and an external reviewer, and led the AB evaluation process and coordinated the actions to complete D1.3. Finally, links with Scientix were strengthened through organizing and participating in a set of events.

Task 1.1 Project management

As planned in the DoA, the PERFORM intermediate meeting in Bristol (UK) took place in April 10th-12th 2017 (Month 18), organized by **UOC** and the local partner **UoB**. 20 members of the 10 partnering institutions participated in this three-day meeting, in which WP leaders updated the consortium on their progress, future tasks were discussed and scheduled in each case study, financial issues were clarified and agreements to improve the use of resources were achieved. The **second General Assembly (GenA) meeting**, attended by all partners, and the **fourth Steering Committee (SC) meeting**, attended by WP leaders, were held the third day of the intermediate meeting.

In the same month, April 24th, 2017 (Month 18), **UOC** coordinated the external review meeting in Barcelona with the attendance of the EC Project Officer and an external reviewer from Odessa National I.I. Mechnikov University (Ukraine). The meeting was also attended by the UOC Coordination Team (CT), all WP leaders and partners conducting the performances, who presented the progress of their corresponding WPs during the first 15 months of the project and responded to the questions. The **evaluation was highly positive and resulted in a set of comments and recommendations that UOC circulated** encouraging partners and particularly WP leaders to follow them. The day after this meeting, **UOC and UAB** organised a visit with the EC Project Officer at two participant schools in the participatory workshops in 2017 (INS Santa Eulàlia and IES Castellbisbal), in which the EC Project Officer had the opportunity to meet and talk with participant teachers and students.

During these months, **UOC** coordinated and supervised a proper technical and financial management through regular email correspondence, online and face-to-face meetings and phone conversations with other partners, providing support to the consortium members on reporting when needed. **UOC** provided advice to other partners for management issues (e.g. related to budget and p-m reallocations, to extension of deadline requirements, to technical and financial reporting issues), for dissemination issues (collecting inputs periodically from partners) and for ethical issues (e.g. procedure to collect consent forms in schools).

Task 1.2 Facilitation of the consortium communication

UOC ensured that all project-related files (research- and management-related) are managed and stored in the intranet and provided support to EUSEA for website-related actions (e.g., update of consortium activities). **UOC** also provided support to **EUSEA** in web-related management issues such as updating new members' profiles and their inclusion in the internal email lists.

As a result of a collective decision made during the intermediate meeting in Bristol (April 2017, Month 18) **UOC** created together with **EUSEA** an internal email list for research purposes including WP2, WP3 and WP4 partners.

Task 1.3 Scientific coordination and project monitoring

UOC led the elaboration of **Deliverable 1.3 Evaluation report of the Advisory Board** that was timely submitted to the EC in October 2017 (Month 24). The report is the outcome of the PERFORM project mid-term assessment by the PERFORM AB on the basis of the project achieved results and objectives during its first period, from November 2015 to January 2017 (Month 1-Month 15), and represents a key input to improve and adapt PERFORM further development.

These are the members of the AB:

- Roger Strand, chairman EC expert group on RRI indicators (University of Bergen, Norway);
- Daniel Erice, entrepreneur in STEM and performing arts (Alioth Arte y Ciencia, Spain);
- Emily Dawson, expert on science learning and engagement, science education research

(University College London, UK);

- Àgueda Gras, science programme manager and expert at European level (European Schoolnet, Belgium);
- Frank Burnet, science communication expert and artist (University of West England, UK).

During the fourth SC meeting in April 2017 (Month 18) it was agreed that WP leaders would suggest two AB members to evaluate their work. **TBVT, UoB, UAB, UNESCO and EUSEA** suggested two or three members and **UOC** elaborated the final list. As for the specific outputs to review, **UOC** asked each AB member to assess the progress of his/her assigned WPs based on the interim technical report (first period: Months 1 to 15), as well as other specific documents (e.g., deliverables, internal reports). Within each WP specific issues were suggested by WP leaders and the CT to AB members to focus on. Also, in parallel to such evaluation process, some WP leaders contacted members of the AB with specific expertise on the actions they were developing in order to ask for advice and guidance: **UoB** contacted Àgueda Gras and Emily Dawson, **UAB** contacted Daniel Erice, **EUSEA** contacted Frank Burnet, and **UOC** contacted Roger Strand. Sometimes it was possible that AB members also attended the activities (e.g., Daniel Erice attended one of WP2 PW in Spain and UK and held a meeting in Paris with TRACES).

The AB members provided their feedback according to a planned timing strategy. Documents and specific questions were provided to each AB member in June 2017 (Month 20), asking for them to send their feedback in mid July 2017 (Month 21). On the basis of this feedback and the WP leaders' reactions to it **UOC** sent back the report to the AB in early September 2017 (Month 23). Two weeks later a skype meeting was held between **UOC** and the AB for the final check of the report. The final version of the report was peer-reviewed by **TRACES** and **UNESCO** in October 2017 (Month 24) and delivered in due time (October 31st, 2017).

Also in this period, **UAB** and **UOC** designed a **shared protocol of RRI implementation and reflection guidelines** to provide the PERFORM consortium with guidelines to meet a set of RRI process requirements. A battery of 10 self-reflective questions were generated and answered by all PERFORM partners. **UOC** and **UAB** organized partners' answers and presented them in the intermediate meeting of the consortium in April 2017 (Month 18) to foster continuous self-reflection on the inclusion of RRI in the different stages of the project till the end of the project.

In parallel, during the reported period **UOC** held several meetings with the UOC library services in order to implement the Data Management Plan.

Task 1.4 Links to STEM education research projects and networks at European level

UOC, EUSEA and SMS participated in **2 events within the Scientix network** (see Task 6.2 for the list of events), in which **UOC and other partners** established contact with other EC projects for exploring opportunities for further collaboration (e.g., NUCLEUS, CREATIONS).

As a result of such previous exploration, and during the reported period, **UOC** provided support to **co-organize together with the H2020 GEDII project a Scientix Future Classroom Lab** on gender and STEM education next December 2018 (Month 27) in coordination with **UNESCO**. To strengthen the links with other research projects, **UOC** invited other H2020 research projects to participate in the event, such as the HYPATIA H2020 project. See Task 5.2. for further details.

1.2.2 Work Package 2 (WP2): Innovative science education methods based on performing arts

During this period, **TBVT** finished and timely submitted the Deliverable 2.1 corresponding to Task 2.1, which was approved in April 2017 (Month 18). From Month 20 **TBVT** is working on

transforming D2.1 into a user-friendly toolkit that includes 11 videos and 9 short documents that will be uploaded to the PERFORM website.

As for Task 2.2, **TBVT, TRACES and SMS** conducted the first round of PW with more than 100 students participating among the three case studies. From May 2017 (Month 19) **TBVT, TRACES and SMS, with the support of UAB, UOC, AJA and UoB** are discussing how to improve the process carried out for the second round that will take place in 2018. In doing so, Case Study Coordinators (CSC: TBVT, TRACES, SMS) are working in the definition of the new PW taking into account WP4 impact assessment, and the local particularities they observed during the implementation.

TBVT also started to set-up Task 2.3 in Spain, in collaboration with CosmoCaixa Science Museum of Barcelona.

Task 2.1 Inclusion of the “human dimension” of science and the values embedded in RRI in performance-based activities

In February 2017 (Month 16), **TBVT** fine-tuned the analysis of the evaluation performed in this task and, with this result, finalized **Deliverable 2.1 Final Protocol of tested methods to transform a performance-based activity into a PERSEIA**. D2.1 was sent for internal review to **UOC, UoB and UoW**, and submitted to the EC on time by the end of Month 16.

In Months 19 and 20 **TBVT** collected feedback from teachers in Barcelona participating in the task to refine some aspects of their role in the process of PERSEIA construction. In order to collect these feedback, short structured interviews were held. In addition to this, in June 2017 (Month 21) **TBVT** received feedback from AB members, which will be taken into account in the future actions.

With the feedback collected, in May 2017 (Month 20) **TBVT** started to generate a **user-friendly version of D2.1** that will be uploaded to the PERFORM website under the “Toolkits” tab. The user-friendly version consists of 11 explanatory short videos recorded and edited by **TBVT** that guide the process of PERSEIA construction in lay language. These videos are accompanied by a group of 9 short documents that explain Exploratory Workshops (EW) protocols, examples obtained in task 2.1, and the results emerged from its evaluation in terms of how PERSEIAs increased positive attitudes towards sciences, hindered negative attitudes and diminished the gender stereotypes. In September 2017 (Month 23) **TBVT** got in contact with **EUSEA** to initiate the design of the user-friendly site in the PERFORM web to allocate these resources and in Month 24 the videos were uploaded to the [YouTube channel](#) and embedded to the [web](#).

Task 2.2 Participatory process with young people, teachers and early career researchers

From February to May 2017 (Months 16 to 19) **TBVT** collected the parental consents of the participant students, teachers and ECRs in this Task in the Spanish case study. **SMS** in UK and **TRACES** in France also collected the informed consents in their case studies.

This Task is composed by three different phases. The first phase includes the first round of workshops that were conducted in the 5 participant schools (from low and medium socio-economic level) started in January 2017 (Month 15, as reported in the intermediate report) and extended until May 2017 (Month 19). **TBVT, TRACES and SMS** were the partners responsible of delivering the PW and organizing the collaboration of teachers and ECRs. **TBVT**, as WP2 leader, coordinated the three case studies and met with **TRACES and SMS** twice during March 2017 (Month 17) to supervise the final implementation schedules and review the overall strategy.

118 students, 11 teachers, and 15 ECRs were involved in these workshops (see Table 3).

Table 3. Case studies, participant schools, number of students, teachers and ECRs and date of delivery of each PW. F stands for the final PERSEIA presentation in each school.

Case Study	School name and	PWs	Students	Teachers	Early	Date
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	location				career researchers	
France (Paris)	Collège Marie Curie, Paris (Low socioeconomic level)	3	24	1	1	24/02/2017
		4	24	1	0	24/03/2017
		5	24	2	1	21/04/2017
		6	24	2	0	28/04/2017
		F	24	2	1	12/05/2017
	Collège Les Toupets, Vauréal (Medium socioeconomic level)	3	20	2	1	24/02/2017
		4	20	1	0	34/03/2017
		5	20	1	0	21/04/2017
		6	20	1	0	28/04/2017
		F	20	1	0	12/05/2017
Spain (Barcelona)	IES Santa Eulàlia, Terrassa (Low socioeconomic level)	2	29	3	2	03/02/2017
		3	29	3	2	08/02/2017
		4	29	3	3	13/02/2017
		5	29	3	2	24/02/2017
		6	29	3	3	03/03/2017
		F	29	3	0	17/03/2017
	IES Castellbisbal, Castellbisbal (Medium socioeconomic level)	1	30	2	3	06/02/2017
		2	30	2	3	10/02/2017
		3	30	3	3	17/02/2017
		4	30	2	3	22/02/2017
		5	30	2	2	06/03/2017
		6	30	2	2	09/03/2017
		F	30	2	0	20/03/2017
UK (Bristol)	Fairfield High, Bristol (Low socioeconomic level)	3	29	1	7	22/02/2017
		4/F	29	2	7	29/03/2017

The second phase (March to November 2017) included the redesign of the PW based on the results of the assessment conducted in WP4. In March 2017 (Month 17) **TBVT and UOC** met to discuss about the observations made by **UAB and UOC** during workshops to assess the educational process and both partners agreed that some changes were needed to improve the pedagogical approach of the PW. **TBVT** then drafted a strategy to redesign the PW in collaboration with the rest of the partners, that was discussed during the Consortium Meeting in Bristol in November 2017 (Month 25). Three main conclusions derived from this discussion: (i) each CSC would be supported by an academic partner from the local context to redesign the PW; (ii) the implication of teachers and ECRs in the whole process would be rethought, and (iii) the PW methodology would be adapted to the opportunities and limitations of each local context. As a

result, in France **TRACES** worked together with **AJA** in the redesign of the workshops, while in UK and Spain **SMS and UoB** and **TBVT and UAB and UOC** respectively did the same.

TBVT coordinated the process and set a work program (shown in Table 4):

Table 4. Work program for the redesign of the three participatory processes.

Deadline	Task assigned
Month 21	Definition of the objectives and methodologies that will be used to establish the PEST alliance
Month 23	Review of WP4 feedback and results from first round of Task 2.2 Participatory Process
Month 24	Re-design of the participatory process and preparation of a participatory process protocol draft
Month 25	Knowledge and expertise sharing among the three case studies (on-line sharing)
End Month 25	Final design of each participatory process
Month 26	Delivery by each CSC to TBVT the participatory process protocol corresponding to their case study
End Month 26	Integration by the TBVT of the protocols coming from each case study and sharing of the Final Protocol of the Participatory Process with the entire consortium

The redesign of the PW was based on the results of the impact assessment of the first round of workshops sent by **UAB**, as WP4 leader, to CSC in June and July 2017 (Months 20 and 21).

In Spain, **TBVT, UAB and UOC** met twice, in June 2017 (Month 20) and September 2017 (Month 23) to review deeply the evaluation highlights and subsequent recommendations. **TBVT** decided after the meeting that the participatory educational process will count with 7 PW instead of 6 (2 hours each), out of which 2 will be dedicated to writing skills. The new flow of the workshops will be as follows in the Spanish case study:

- PW1: Review of topics related to Societal Challenges
- PW2: Scientific and Artistic Methods
- PW3: Script writing and Performing skills
- PW4: Critical Thinking and Reflective skills
- PW5: Gender Barriers and Stereotypes in STEM careers
- PW6: Script writing and Performing skills
- PW7: Rehearsal

In UK, **SMS** met **UoB** in August 2017 (Month 22) to plan PWs' content and format in UK schools, which better matched school timetables, and commitments and capacities. This resulted in a format of 4 PWs, each of 3 hours duration. The fourth PW incorporates the PERSEIA and all PWs incorporate discussion on gender in science research and reflective skills development:

- PW1: Introduction to science busking; introduction to ECR research, incorporating personal, societal and RRI values relevant to ECRs present

- PW2: Scientific and presentation skills; development of ECR content into busking presentations; critical thinking
- PW3: Advanced development of busking skills and ECR research-linked presentations
- PW4: Final rehearsal of ECR research-linked busking presentations; final PERSEIA; reflection on the participative process

In September and October 2017 (Months 23 and 24) **SMS**, following the schools' recruitment, delivered detailed discussions with teachers, formats and timetables ratified with participating schools.

Finally, in France **TRACES** organized 2 meetings in July and August 2017 (Months 21 and 22) with the performers and **AJA**, in order to write the main approach and methodology of the second session of the PW. The PW were reorganized as follows:

PW1-PW2 – To create the need and the desire to meet and discuss with the ECRs: PW1 will use a mix of pictures, photos and drawings to make the students understand what PERFORM is; PW2 will organize theatre improvisation, in small groups, following 2 defined frames.

PW3 - First meeting and discussion with the ECR: The students play the small sketches they created during the last PW, in front of the ECR, in order for her/him to discover what students have in mind talking about science and research. To enhance the contents of the discussion, the ECR will have prepared (especially during the ECRs training) some pictures, some short movies, some objects related to her/his work and showing some parts of her/his daily job.

PW4 to PW7 - Enhance the first sketches created by the students, showing their stereotypes, their view of the topic. Creation of new sketches, always using improvisation theatre, with the ECR, coming from their discussion and the contents brought by the ECR (some of the PERFORM key topics will be approached again, at that time): this work will be done in small groups and sometimes, with the full group.

As for the need to implicate more ECRs and teachers **AJA** suggestion of developing a ECR Training, and Performers ECR Science communicator and Teacher (PEST) alliance in each case study was followed. This PEST alliance will be developed in each case study in November and December 2017 (Months 25 and 26) and will include two phases:

1. **TBVT, SMS and TRACES** take part jointly to at least some sessions of the ECR training in the corresponding case study.
2. ECR, **TBVT, SMS and TRACES** have an informal meeting of 1 or 2 hours with the participant teachers in each school to discuss jointly visions of science and, secondly, practicalities of the PW.

The third phase will take place from January to March 2018 (Months 26 to 28).

Task 2.3 Pilot PERSEIA scaled up into informal context: implementation in science museums

This task will initiate in April 2018 (Month 30), as planned in the GA, but **TBVT** decided to advance its start in order to facilitate its implementation. In September 2017 (Month 23) TBVT contacted CosmoCaixa Science Museum in Barcelona and had a meeting in order to present the PERFORM project and to start the collaboration to implement in this museum the Task 2.3.

1.2.3 Work Package 3 (WP3): Building science education and communication capacity for teachers and early career researchers

During the reported period **UoB** coordinated and completed the first phase the ECRs training (April 2017, Month 18) with the support of **UOC, UAB, TBVT, TRACES, SMS and AJA** and carried out an evaluation of all the ECR training programmes in order to inform the second phase of the training. **UoB** also delivered a report on the progress of their work to the PERFORM AB, received feedback, and fed this in to the development of the training for teachers and ECRs, and the toolkits design.

As a result of this work, in May 2017 (Month 19), **UAB and UOC**, supported by **UoB and AJA**, submitted an abstract to the VI Congress of Social Communication of Science, organised by the Spanish Association of Scientific Communication and the University of Córdoba. The abstract was accepted and researchers from **UAB and UOC** will share the experience of WP3 training in Barcelona at the congress in November 2017 (Month 25). Also, in August 2017 (Month 22), **UoB** submitted an abstract to the National Coordinating Centre for Public Engagement's conference, Engage. A representative from **UoB** will join a panel of public engagement professionals to share learning about reflective training for researchers, gathered from collaborating in the development of the PERFORM training programmes in the UK and Spain.

From May 2017 (Month 19), activity turned to the development and planning of ECR training in France, Spain and the UK, as well as the first phase of teacher training in France and the UK. The first phase of teacher training and second phase of ECR training in the UK commenced in October 2017 (Month 24).

The first teacher training was delivered by **TBVT** in Spain in July 2017 (Month 21), as part of the **UAB's** summer school for teachers, and this training was filmed and evaluated by **UoB** in order to inform the development of future training for teachers in Spain, as well as the UK and France. Teacher training was planned, scheduled, advertised and organised in the UK and France. The first teacher training was delivered in October 2017 (Month 24) in the UK, with a second session in November 2017 (Month 25). In France the first phase of teacher training is integrated with the ECR training and will be delivered in Month 25.

In August 2017 (Month 22), **UoB** began planning the toolkits for teachers and ECRs that will share learning and best practice from the training programmes in PERFORM.

Task 3.1 Development of knowledge sharing workshop on performance-based activities and RRI values

This task has now been completed.

Task 3.2 Development of training and guidelines for researchers

In April 2017 (Month 18), the training for ECRs in the UK, the last of the three countries' training programmes, was completed. ECR training programmes in the three countries were broadly successful and reached **54 researchers in Spain, 8 researchers in the UK and 4 researchers in France**.

In the final session of the UK training, titled "Reflection", the cohort came together and reflected on their experience in the project and what they felt could be usefully learned and applied for future participants in the project. In February 2017 (Month 16), **AJA** met the ECRs involved in the workshops in Paris to reflect on their experience in the project. In Month 17, **TBVT** meet the ECRs involved in the workshops in Castellbisbal to reflect their experiences in the project. The session was recorded, and short videos were sent to **EUSEA** (WP6 leader) for dissemination purposes. In May 2017 (Month 19), an evaluation expert from **UoB**, visited ECRs from the project in Barcelona to gain their feedback via a group interview held together with **UAB and UOC** (also as part of Tasks 4.3 and 4.4). The outputs of these sessions, plus observations from the training sessions fed in to an internal evaluation report, which outlined key findings from the

first phase of training, and recommendations for the development of the next phase. This report was shared with all partners and gave them the opportunity to learn from the successes of the different formats and approaches to ECR training in the different countries. The report also formed the basis of WP3 report to the AB.

From May 2017 (Month 19), work began in the three countries to redevelop the training for the second phase of the project. In France, **AJA** presented their redesigned plan and call documentation for the second phase of ECR training in Month 21. The new design reduces the time requirement to 2 days, in order to increase applications, includes more practical application of the theoretical material covered and introduces fun games to encourage greater engagement. Teachers, ECRs, performers and science communicators will attend this training. There are 2 objectives: (i) to build, with the ECRs, their speeches and gamification of their research and their daily work; and (ii) to build a common culture between the teachers, the ECRs, the science facilitators and the performers. **TRACES** will attend the training as they did the previous year, however this time, the session will also include the teachers involved in the project and will explicitly focus on developing the PEST alliance –working together to build common values. **TRACES** will also deliver two further sessions, one at a mid-point in the PW, for teachers and researchers to reflect together about the work they are doing, and one following the PW to reflect on their experience in the process. In the UK and Spain, in response to feedback regarding a perceived disconnect between the experience of the training and that of the PW, while keeping the same theoretical themes, the practical aspects of the sessions are more grounded in preparing researchers for their increased role in the workshops in schools.

In August 2017 (Month 22) **UoB and SMS** met to discuss the PW, and how to improve the alignment of the training and participation of researchers and teachers in the workshops in schools. This led to the addition of more substantial science busking training for researchers and teachers, and practical workshops tailored to the more substantial role for ECRs in the second phase of PW. The timing of the training programme was also changed to run prior to the PW, rather than alongside, as it did in phase 1 of the project.

In Spain, **UAB and UOC** met in July 2017 (Month 21) to redesign the training and three further sessions were introduced to the training programme, one focussing on Science in Society, presented by **UOC**, in collaboration with **UoB** and a session prior to the PW to prepare the researchers for their roles in schools' workshops, delivered by **TBVT**. In addition, an extra optional session will be organized by **TBVT** in which ECRs and teachers will work together in the PWs protocols in order to facilitate the PEST alliance. **UAB** has worked with UAB's administration to tailor the training offer and advertising to encourage strong cohort development.

Practical preparations for all of the trainings are underway. In France, by September 2017 (Month 23), 7 researchers have been recruited for the training and PW, 1 post-doctoral researcher and 6 PhD researchers, 1 male and 6 females. Training will take place in November 2017 (Month 25) and will be held at the **TRACES** offices within the ESPCI (École Supérieure de Physique et de Chimie Industrielles) in Paris. In the UK, by Month 23, 16 researchers have been recruited through the networks of the public engagement team, researcher development at **UoB** and Bristol Doctoral College. The cohort includes 10 PhD researchers, 6 post-doctoral researchers, 8 males, 7 females. All logistical arrangements have been made, rooms booked and speakers engaged.

The training programme began at the end of October 2017 (Month 24) with an introduction to engaging audiences through science busking, delivered by **SMS**, with 15 researchers and 4 teachers attending. In Spain, the programme is fully planned, trainers have been engaged and bookings for their travel have been made.

UAB met with the UAB postdoctoral school in July 2017 (Month 21) to present the training plan. The postdoctoral school liked the programme and agreed to host and promote it. **UAB and UOC** met **UoB** that same month to discuss the general proposal and to coordinate with the rest of trainers the specific design of the sessions. In September 2017 (Month 23), a meeting between

UoB, UAB and UOC took place to make a follow-up of the design of the different sessions and agree on the final programme. With this information, a second meeting with the UAB postdoctoral school then took place at the beginning of October 2017 (Month 24) to present and discuss the final programme and launch officially the call. The cohort in UAB has been limited to 20 people and consists of PhD researchers corresponding to a wide diversity of scientific fields. **TBVT** disseminated information about the ECR training in Spain through their webmail list and social networks in March 2017 (Month 17) and during the Peptide Therapeutic Symposium celebrated on September 2017 (Month 23) in Parc Científic de Barcelona. In Month 24, **UAB** made all the logistical arrangements for the training programme and managed the contact with ECRs

From August 2017 (Month 22), **UoB** began the design of toolkits, and identified opportunities within the ECR training programmes to gather material, and engage trainers to provide input to the materials that will be produced. In response to the way that the wider project has developed and learning we have made along the way, the toolkits will be produced concurrently with the second phase of training, rather than in advance of. **UoB, UOC, UAB, TBVT, TRACES, SMS and AJA** will make the most of the networks of researchers they have recruited in the three case studies to feed in to and feedback on and test the toolkit resources. In addition, **UoB** is making relationships with individuals in institutions that provide training to researchers who would be willing to provide feedback and potentially test the resources produced – one such relationship has been made with staff development officers at the University of Sheffield. To pursue this, **UoB** will be presenting PERFORM's ECR training at the Engage conference in Bristol in December 2017 (Month 26). Toolkits will be focused on a collection of short, easily accessible resources, including videos, provocations designed to spark interest in discussions and trainings, and "recipes" for key theoretical approaches developed during the training.

Task 3.3 Development of training and guidelines for teachers

In July 2017 (Month 21), the first teacher training session was delivered by **TBVT** in Barcelona, hosted by the summer school of the Institute for Education at **UAB**. **TBVT** advertised the course through their networks, as well as with the schools involved in phase 1 of the project, and four teachers attended a training on 'developing a PERSEIA for your science teaching'. The course was filmed and evaluated, giving input to inform the development of the next phase of teacher training in Spain, as well as the teacher training development in the UK and France. The programme was positively evaluated by the teachers involved, and **TBVT** have some clear feedback as well as their own perspective on what might be usefully changed in future as well as what would be worth sharing in toolkit resources. In September and October 2017 (Months 23 and 24), **TBVT** met with ICE-UAB in order to prepare the implementation of the Teachers Training Course in summer 2018 (Month 33) as part of the summer-school that UAB offers to teachers in Catalonia.

In the UK, planning for the teacher training began in May 2017 (Month 19). Feeding from conversations with teachers in schools involved in the project it was decided that the training should focus on philosophical techniques for discussing complex topics in science, and performance techniques for science teaching. **UoB** worked with the Centre for Science and Philosophy (UoB) to develop a training entitled Philosophy in the Science Classroom. This training was held at We The Curious, a science museum in Bristol in October 2017 (Month 24), attended by 15 teachers, and was evaluated very positively, with some useful feedback. Based on this feedback and the trainers' experiences, this training will be redeveloped and delivered again between May and June 2018 (Months 31 and 32). A further training, Performance in the Science Classroom, is being developed by **UoB** in collaboration with theatre company Kilter, and will be presented at the Watershed Arts Centre in Bristol in November 2017 (Month 25), and has already had registrations from 35 teachers. The training will be similarly evaluated, and redeveloped for a second phase of training in between May and June 2018 (Months 31 and 32).

In France, development and planning for the teacher training, led by **TRACES**, began in May 2017 (Month 19). Teacher training in France will take place in two separate stages, the first, as described above, is related to the training for ECRs in preparation for the participatory workshops and will be delivered to the teachers from the schools involved in the project. **TRACES** will then take the learning and feedback from this training, and present a second training for these teachers, and a wider audience of invited teachers from their network, developing the ideas around working with researchers, tools for talking with young people about science and grand challenges, and using performance techniques for science teaching. This second training will take place in April 2018 (Month 30) at **TRACES** offices within the ESPCI (École Supérieure de Physique et de Chimie Industrielles) in Paris. Advertising for this training began in Month 24, with invitations being sent out to teachers in the TRACES network of over 950 individuals and schools, and the closing date for applications is at the end of February 2018 (Month 28).

1.2.4 Work Package 4 (WP4): Impact assessment of the participatory educational process in students' engagement in and learning about science

During the reported period, **UAB** supported by **UOC** coordinated and implemented the assessment instruments in the 5 secondary schools participating in the workshops since January 2017 (Month 15). Such implementation was conducted until June 2017 (Month 20) and included observations of all PW and a formative evaluation tool during the development of the participatory process, as well as the implementation of assessment instruments once the workshops were over (i.e. students' surveys and focus groups, and interviews to teachers and ECRs).

From March to July 2017 (Months 17 to 21), **UAB and UOC** analysed all the generated data before, during and after WP2 workshops. As a result, four internal analysis reports were generated in each case study, each corresponding to one of the four implementation goals of the PERSEIAs: 1) Interaction between students and ECR, 2) Quality of the resultant performances, 3) Transversal competences, 4) RRI values. Analysis reports were shared with **TBVT, TRACES and SMS** in June and July 2017 (Months 20 and 21) and feedback meetings were held with them between July and October 2017 (Month 21 and Month 24) to discuss the results and their main implications for the redesign of the PERSEIAs. These results are currently being processed by **UAB and UOC**, with the support of **EUSEA**, to be returned to PERFORM participants and the broader public in a summarised and accessible way.

During September and October 2017 (Months 23 and 24), **UAB** supported by **UOC** started to work on the redesign and refinement of the assessment strategy and tools to be implemented during the second round of PW. Such redesign is based on the insights and reflections generated during the first implementation, the new design of the PW in schools and the feedback provided by the AB in August 2017 (Month 22).

Task 4.1 Development of an innovative and participatory impact assessment research methodology

This task concluded in Month 10. However, **UAB and UOC** continued to work on the two research articles generated with results from the task. Most specifically, during the reporting period the article entitled '*Responsible Research and Innovation Indicators for Science Education Assessment: How to Measure the Impact?*' was accepted for publication in the International Journal of Science Education (Q1, IF:1,85) and published online in October 2017 (Month 24). It is currently available at the following permanent link (gold open access): <http://dx.doi.org/10.1080/09500693.2017.1392643>. **EUSEA** published the article on the PERFORM project website (<http://www.perform-research.eu/rri-in-the-education-practice/>)

and shared it through social channels (Facebook and Twitter). The article was also shared on RRI-tools resources repository.

The other article is still under review at Research in Science Education.

Task 4.2 Evaluation of the social media-based impacts of the performance events on young people's engagement in science

To complete **Milestone 4 'ICT development of an automated tool to enable social media data analysis'** (submitted in October 2017, Month 24), **UoW** conducted research on students' reception of PERFORM engagement activities on Twitter, WhatsApp and Instagram. **UoW** developed a social media analysis tool which was calibrated to automatically gather and analyse discourse about science performances. Iterative testing and improvement of the tool was implemented to enhance its validity and reliability. The tool gathers tweets related to the different PERFORM activities from the social media Application-Programming Interface (API) for Twitter and Instagram for processing. The tool analyses responses as they come in, producing analytics in real time. During the reported period **UoW** has been running the tool for several on the collection side, and more recently on the analysis.

UoW faced key challenges in accessing social media data in the UK and France cases due to schools' regulations on the use of social media by students. Therefore, this tool is primarily focused on the overall project level and Spain case in terms of data collection. The tool is able to handle data in Spanish, English and other languages, with the help of a Google Translate filter that operates automatically. Results from the tool will be included in the final analyses and reporting for the WP4 deliverable on the social media responses and impacts from the project engagement with young people by **UoW** (D4.2, due on September 2018, Month 35).

The **UoW** team is currently working on preparing a research report about the nature of sharing (through social media and other pathways) that occurs for young people engaged through PERFORM. Among other things, the results show that even when young people engaged by the project were positively disposed to all aspects of the project, they were reluctant to reveal this positivity in their social media personas for fear of being perceived as 'too keen'. A full empirical research 'Report on social media responses to science performances' (D4.2) based on social media and interview data will be ready in the coming months for review by the broader PERFORM research team.

Furthermore, preliminary research results were presented at a workshop on Public Engagement with Science Online at Technion University in Haifa (Israel) in June 2017 (Month 20). The research is also underpinning two blog posts being produced for the Public Understanding of Science journal blog.

Task 4.3 Evaluation of the acquisition of transversal competences by students during the educational process

As mentioned in the impact assessment strategy, transversal competences were explored in the project through students' inputs provided in the surveys (as a first quantitative approach) and researchers observations of the workshops complemented by students, teachers and ECRs inputs through focus groups and interviews (as a qualitative in-depth approach).

Between February and June 2017 (Months 16 and 20), **UAB** with the support of **UOC** continued with the implementation of the assessment tools foreseen in the assessment strategy, covering both the development of the workshops and the months after their implementation. First, systematic observations from all the PW were gathered. Observations were then triangulated after the workshops with the development of a focus group with selected participant students, a group interview with involved teachers and a group interview with ECRs. The questionnaire

implemented before the workshops was delivered again to students to track the changes in their answers and provide feedback about the workshops (see implementation description in Task 4.4). Furthermore, during the workshops, **UOC and UAB** with the support of **TBVT, SMS and TRACES** provided a learning chart devised to foster students' reflective thinking and learning to learn skills, by inviting students to reflect about i) their motivation to learn, ii) what they were learning/had learnt, and iii) how they had learnt it.

All the case studies followed the same implementation strategy, although the specific tools were adapted to each local context and workshop implementation approach. While the observation guide and pre- and post-PERSEIA surveys were already designed, **UAB and UOC** worked on the design of the focus group and group interviews between March and June 2017 (Months 17 and 20). A general design was made taking into account WP4 assessment criteria and indicators which was then adapted to each case study taking into account preliminary results from the observations and the pre- and post- PERSEIA surveys.

In the case of Paris, **UAB** visited Marie Curie and Collège Les Toupets secondary schools during all the remaining PW (PW2-PW7) and conducted structured observation with involved students in one of the groups, which was followed through the whole process. As expected in the assessment strategy, the second group was followed intermittently and **UAB** also conducted observations in PW4 and PW7 in both schools. All workshops observed were recorded with a camera provided by **TRACES**, following the audio-visual recording guidelines. The final performance of the PERSEIAs generated in both schools was also observed and recorded by **UAB** researchers in May 2017 (Month 19), and notes were systematised using the final PERSEIA observation template. In-between workshop sessions, **UAB** researchers shared with **TRACES** impressions related to the observations, providing informal feedback around punctual aspects. Between May and June 2017 (Months 19 and 20) **UAB and UOC** conducted a 1.30-hour focus group with selected students in each school (10 students in Collège Les Toupets and 9 students in Marie Curie). A 1-hour group interview was also conducted during May and June 2017 (Months 19 and 20) with involved teachers to collect their impressions about the project and the impact on the school students. Two teachers were interviewed in Marie Curie and 4 in Les Toupets. **TRACES** supported **UAB and UOC** in the communication and logistics with the schools.

In the case of Bristol, observations of the workshops in Fairfield High School were conducted both by **UOC and UoB**. The whole group was observed, as students were not split in two subgroups like in the other countries. A researcher from **UOC** visited the school in February 2017 (Month 16) to observe PW3-PW4, while a researcher from **UoB** conducted the observations during PW5-PW6 (the same one as in PW1-PW3). Following advice from **UoB and SMS**, PW were only recorded once, in PW3-PW4. Furthermore, **SMS** conducted the observations of students' final PERSEIA at the end of March 2017 (Month 17). Following the guidelines provided by **UAB**, **SMS** took notes of students' performances during the event held at Fairfield High School, and sent them to **UAB** in June 2017 (Month 20). In May 2017 (Month 19) **UOC**, supported by **SMS and UoB** conducted a 1-hour focus group with selected students from Fairfield High. **SMS** coordinated the event, in which PERFORM students visited Bristol University, while a researcher from **UoB** co-facilitated the focus group. An online survey was also sent by email to the 2 participating teachers. The online format was considered more appropriate to provide critical feedback than a face-to-face interview, due to the cultural setting. For the ECRs interview, we used the transcripts from the reflexion session with ECRs conducted by **UoB** as part of WP3, as the data collected already addressed the aspects covered in WP4 group interview.

In the case of Barcelona, **UAB and UOC** started the observations at IES Castellsbisbal at the beginning of February 2017 (Month 16) and continued with the observations at INS Santa Eulàlia, which began in January 2017 (Month 15). In both schools, one of the groups was observed throughout all the workshops, while the second group was intermittently observed (PW1, PW3 and PW6). In all cases, **UAB and UOC** followed the structured observation guide and the audio-visual recording guidelines. **UAB and UOC** researchers also observed students' final performance in both schools and recorded their notes according to the PERSEIA observation

guide. In-between workshop sessions, **UAB** researchers shared with **TBVT** impressions related to the observations, providing informal feedback around punctual aspects. Between April and May 2017 (Months 18 and 19) **UAB** and **UOC** conducted a 1.30-hour focus group with selected students in each school (10 students in INS Santa Eulàlia and 7 students in IES Castellbisbal). Furthermore, at the INS Santa Eulàlia **UAB** and **UOC** also designed and implemented a 1-hour pilot reflective session with all the participating students. This session was oriented towards enhancing learning to learn skills, such as fostering reflective thinking about their learning process. Most specifically, during this session students reflected about the learning goals of PERFORM and they were asked to assess whether the project had managed to reach them or not and discuss about it. A 1-hour group interview was also conducted during these months with involved teachers to collect their impressions about the project and the impact on the school students. Ten teachers were interviewed in INS Santa Eulàlia (corresponding to those directly participating in the workshops and those providing support to the project) and 3 teachers in IES Castellbisbal (corresponding to those directly participating). In the case of INS Santa Eulàlia one of the two teachers directly participating in the workshops also answered to some questions via online to add more information to the group interview. **UAB** and **UOC** researchers also conducted a group interview with ECRs in May 2017 (Month 19). This interview was jointly prepared and implemented with a researcher from **UoB**, as they were gathering similar data for WP3.

Table 5. Summary of participants reached by the assessment tools in each case study.

Assessment method applied	Case Study	Sample (n)
Observation	Barcelona Bristol Paris	All students participating in the workshops
Written surveys Pre- PERSEIA	Barcelona	Terrassa, n= 44 Castellbisbal, n= 27
	Bristol	Fairfield High, n= 19
	Paris	Vauréal, n=25 Marie Curie, n=22
Written surveys Post- PERSEIA	Barcelona	Terrassa, n= 37 Castellbisbal, n= 22
	Bristol	Fairfield High, n= 19
	Paris	Vauréal, n=19 Marie Curie, n=22
Control surveys Pre/Post- PERSEIA	Barcelona	Terrassa, n= 16 Castellbisbal, n= 18
	Bristol	Fairfield High, n= 13
	Paris	Vauréal, n= 31 Marie Curie, n=17

Focus Group	Barcelona	Terrassa, n= 10 Castellbisbal, n= 8
	Bristol	Fairfield High, n= 8
	Paris	Vauréal, n=10; Marie Curie, n=9
Teachers Group interview	Barcelona	Terrassa, n= 10 Castellbisbal, n= 3
	Paris	Vauréal, n=4 Marie Curie, n=2
Teachers Written online survey	Barcelona	Terrassa, n= 1
	Bristol	Fairfield High, n= 2
ECRs Group interview	Barcelona	Terrassa&Castellbisbal, n=3
	Bristol	Fairfield High, n= 7
ECRs Written online survey	Barcelona	Terrassa, n= 2 Castellbisbal, n= 2
	Paris	Vauréal& Marie Curie, n=4

The weekly on-line meetings that started in January 2017 (Month 15) helped **UAB and UOC** ensure coherence in data collection among case studies, together with the adaptation of observations to the development of the PWs, being responsive to the insights and data collected through the educational process. In all cases, observations after the workshops were systematised by **UAB and UOC** researchers after each session, using a Word file for the complete set of notes (narrative) and an Excel template for each school based on the items of the systematic observation guide. All the observations and systematised notes were anonymised following PERFORM ethical standards set in Deliverable 7.1. Transcripts and data from the focus groups, group interviews and online surveys were also anonymised.

From March to July 2017 (Months 17 to 21), **UAB and UOC** analysed all the data collected through observations, written surveys and learning charts, focus groups and group interviews. As a result, four internal reports were generated in each case study. Each of the documents extensively reported the data collected through all the assessment tools and provided an analysis focused on the goals identified for the development of the PERSEIA. Altogether, the analysis reports contained more than 100 pages in each case study. Those results of the analysis corresponding to transversal competences were compiled in one internal research report, i.e., promoting the acquisition of transversal skills amongst students.

As a way to explore how the workshops approached this goal, the focus was set on three different types of transversal competences: i) learning to learn skills, ii) civic and social skills, iii) sense of initiative and entrepreneurship. More specifically, our analysis was oriented towards exploring to which extent PW facilitated learning spaces to train and put in practice students' transversal competences, and what aspects facilitated or hindered such practice. Therefore, the aim was to characterize the process according to its capacity to foster transversal competences, and not to assess students' individual transversal competences.

For that purpose, students' self-perceptions were first explored by **UAB and UOC** in relation to such transversal competences through the questionnaire conducted before and after the

workshops (see Task 4.4. for more detail on its implementation during the reporting period). Students' answers were analyzed for both questionnaires independently by looking at the percentage of answers reported by students. Answers were then compared from PERFORM group with answers from the control group. For PERFORM students, differences between boys and girls were analyzed, and between groups of students (in France and Spain, where students were divided into two groups in each school). Finally, in order to see whether students' answers changed between the pre- and the post-PERSEIA surveys, the variation of every individual answer for each question was calculated. Then researchers' observations of the workshops were analyzed to explore in-depth the pedagogical context and learning approach and to which extent and how it fostered the *mise-en-place* of skills and competences implied in the creation of the PERSEIAs. All these results were complemented with students' inputs further collected through the focus group and learning charts. Finally, to complete the analysis, **UAB and UOC** analyzed teachers' and ECR's perceptions about the fostering of students' transversal skills through the process gathered through the oral and written interviews.

UAB shared analysis reports with case study coordinators in June and July 2017 (Months 20 and 21) and feedback meetings were held between **UAB and UOC** and **TBVT, SMS and TRACES** between this month and September 2017 (Month 23) to discuss the results and their main implications for PERSEIAs redesign. The analysis was presented emphasising strengths of the process and aspects to improve, according to the different data inputs. Highlights from the analysis and related recommendations were also identified in the three case studies and shared with CSC, in order to contribute to the redesign process in the second implementation round.

Finally, between September and October 2017 (Months 23 and 24), these results were processed by **UAB and UOC** with the support of **EUSEA**, to be returned to PERFORM participants in a summarised and accessible way. One short video containing three main messages addressed to different stakeholders (students, teachers, researchers) will be generated in each case study as an output for this return of results that through graphic animations will highlight the key messages defined within the project team.

Also, **UAB** supported by **UOC** started to work on the redesign and refinement of the assessment strategy and tools to be implemented during the second round of PW. Such redesign is expected to incorporate the learnings and insights gathered during the first implementation round and the feedback provided by the AB in August 2017 (Month 22). For that purpose, **UAB and UOC** focused on the pre- and post survey, the systematic observation guide and the formative evaluation, by working around two main aspects. First, a better grounding of assessment indicators related to transversal competences in the specific design of the PW, e.g. we will further tailor the three categories of skills identified in our framework to the pedagogical approach of PERFORM and the skills put in practice by students. The availability of the PW protocols and dialogue with CSCs is key to allow such tailoring in this second round. Second, the presence of the formative evaluation to enhance students' self-reflection about their learning process and approach some assessment aspects crucial to PERFORM (e.g. learning to learn skills, RRI values). This will be possible by integrating formative evaluation in the design of the workshops, as part of students' learning and creation process.

In order to ensure a proper integration of the assessment within the PW designed in WP2, **UAB** supported by **UOC** held meetings with CSC in each country during September and October 2017 (Months 23 and 24). The agenda of such meeting included: i) the presentation of the global assessment strategy for the second round, including the description of changes and the discussion of logistic and coordination issues, and ii) the provision of feedback to WP2 on the first draft of the PW. In Barcelona, a meeting between **UAB, UOC and TBVT** was held at the end of September 2017 (Month 23), and in France, researchers from **UAB and UOC** held a meeting in Paris with **TRACES** in October 2017 (Month 24). For the Bristol case study, **UAB and UOC** held a skype meeting with **SMS** in Month 23.

Task 4.4 Assessment of the Responsible Research and Innovation values

RRI values within the PW were explored through students' inputs provided in the surveys (as a first quantitative approach) and researchers observations of the workshops complemented by students, teachers and ECRs inputs through focus groups and interviews (as a qualitative in-depth approach).

For that purpose, in addition to the implementation of the assessment tools described in Task 4.3., between March and May 2017 (Months 17 and 19) **UAB** supported by **UOC** implemented the post-questionnaire after the workshops. The objective of implementing this second survey was twofold: i) to compare students' attitudes and perceptions towards science and STEM careers, with an emphasis on RRI-related dimensions (gender stereotypes, ethical issues, inclusiveness, engagement and critical/creative thinking), before and after the implementation of PERSEIAs; and ii) to examine participants' perceptions towards the PERSEIAs process, also as an input to inform the design of the focus groups. In order to evaluate whether students' answers were specific to the PERFORM group, **UAB and UOC** also conducted these questionnaires (pre- and post-PERSEIA) among a group of students who did not attend to the workshops: the control group.

Except for IES Castellbisbal (Barcelona), the post- surveys were delivered once the workshops were finished, in specific time-slots scheduled for the occasion (during March 2017 (Month 17) in Barcelona, April 2017 (Month 18) in Bristol, and May and June 2017 (Months 19 and 20) in Paris). These were answered by PERFORM students and by the control group in each school, from which parental informed consent was obtained. In the case of Bristol, **SMS** arranged the implementation dates of the survey in Fairfield High School and managed the informed consent for the control group. In the case of Barcelona, the post-PERSEIA survey was delivered at IES Castellbisbal after the performance of the scientific monologues, due to difficulties in finding an extra time slot with students. **TBTV** collected the informed consents of the control group in Castellbisbal secondary school and supported the **UAB** team in the collection of informed consents in Terrassa. In Paris, **UOC** supported by **TRACES** conducted these surveys.

From March to July 2017 (Months 17 to 21), **UAB and UOC** analysed all the data related to RRI values and collected through observations, written surveys and learning charts, focus groups and group interviews. As in the case of Task 4.3., such analysis was reported in one internal research report for each case study, which focused on including RR values in the participatory learning process and boosting motivations towards science.

As a way to explore how the workshops approached this goal, we focused on three different aspects of RRI values: i) inclusiveness, ii) engagement, and iii) ethics integration. **UAB and UOC** also analyzed students' general perceptions and attitudes towards science before and after the workshops in order to contextualize the analysis and identify potential changes resulting from students' participation in the project. Gender was included as a variable of analysis along all these aspects.

Pre- and post- surveys explored students' perceptions and attitudes towards science around several RRI-related dimensions, such as: students' feelings on science learning at school, motivations towards studying a scientific career, personal value of science learning, perceptions of gender-related roles in science or understanding of the nature of science. Students' answers to the survey were further explored through the learning charts and the focus groups conducted. Furthermore, in order to explore if and how the pedagogical context and related factors of the workshops had integrated RRI process requirements and fostered learning outcomes, **UAB** analysed the transcription of the observations during the whole process. For the analysis of inclusiveness, observations mostly focused on the implementation of the designed activities and their facilitation (to identify process requirements) and on students' performance and participation throughout the workshops. Students' cognitive engagement in the workshops was approached mainly through observations focused on the capacity of the learning process to foster students' questioning and reframing, systems thinking, the connection of topics with experience, and the consideration of different perspectives and points of view in their discourse.

Data on emotional aspects of learning was also collected and analysed, such as students' enjoyment and affective reactions towards the topics approached and methods proposed. Finally, ethics integration was analysed through the observation of different process requirements during the implementation and facilitation of the workshops that might facilitate the sharing of the human dimension of science (science as a process). To complete such analysis, both involved teachers' and ECRs' perceptions of the educational process implemented were explored.

As with Task 4.3, the analysis reports corresponding to RRI values were shared by **UAB and UOC** with CSC in June and July 2017 (Months 20 and 21) and feedback meetings were held between WP4 and WP2 between July and September 2017 (Month 23) to discuss the results and their main implications for the redesign of the PERSEIAs.

During September and October 2017 (Months 23 and 24), the **UAB** supported by **UOC**, started to work on the redesign and refinement of the assessment strategy and tools to be implemented during the second round of PW. In terms of Task 4.4., such redesign is paying attention to the exploration of the RRI values embedded within PERFORM's scientific content shared with students, which is a core and challenging aspect of the project. Acknowledging that the first operationalization of indicators prioritized procedural aspects over content ones, WP4 is working to identify further assessment indicators related to science values (e.g. indicators associated to the criteria *Understanding of the nature of science (NOS)*, *Connecting scientific topics with values*) and will test them through implementation in the second round. Such a work is closely connected to WP2 re-development of the scientific contents approached through the PERSEIA activities. Furthermore, **UAB and UOC** are working to enrich and further expand the analysis framework in relation to gender, through the adoption of an intersectional approach in the assessment strategy.

1.2.5 Work Package 5 (WP5): Sustainability and Policy Impact

During the reported period **UNESCO** together with relevant members of the PERFORM consortium including **UOC and EUSEA** continued to advocate and promote PERFORM in line with the goals and objectives under WP5: ensuring sustainability and maximising policy impact of the PERFORM project.

Task 5.1 Generation of a sustainability plan

This task ended up in January 2017 (Month 15) with the submission of the Deliverable D5.1 Sustainability plan. Nevertheless **UNESCO** continued work in this line. In April 24th, 2017 (Month 18), **UNESCO** led a presentation of the PERFORM sustainability plan was made during the EC external review meeting hosted by **UOC** in Barcelona. On this occasion, the concept of "myPERFORM" was shared and discussed with the whole consortium and with the EC Project Officer and the external reviewer, who made suggestions to rethink the concept so as to ensure its sustainability in the long term.

In the same vein, in June 2017 (Month 20), the conclusions of deliverable D5.1 were reviewed by the AB members. Their feedback was highly positive. Furthermore, on "myPERFORM", the AB invited **UNESCO** as WP5 leader to seek support from the European Commission's EK2 framework. **UNESCO** will take advantage of the 12th Scientix Projects' Networking Event in Brussels in December 2017 (Month 26) to discuss more about the future ways of cooperation in this regards. Moreover as far as fundraising and sustainability of PERFORM is concerned, **TBVT** has been in contact with Chinese representatives to discuss the possibility of developing a PERFORM pilot project in China.

During the reported period, **UNESCO** worked on several communication tools and a synthesis communication material about "myPERFORM". Finally and in line with the AB

recommendations, **UNESCO** worked in cooperation with **EUSEA and UOC CT**, on a two-page flyer and an electronic banner of PERFORM. The goal of these tools is to support our common efforts in advocating and lobbying actions in promoting PERFORM during big events related to Science, Technology, Engineering, Arts, Mathematics (STEAM) and science communication. The previous-mentioned tools will be translated the next coming months to several other languages including Arabic, Chinese, French and Spanish.

Task 5.2 Maximize the policy impact of PERFORM

As part of its duty in maximizing the policy impact of PERFORM, **UNESCO** shared with the consortium (April 2017, Month 18) the latest UNESCO analytical policy tools and indicators. The information shared with the consortium aimed at providing the necessary tools and literature in order to conceive the most effective toolkits for students and teachers.

The folder shared was divided in 4 subfolders.

1. STEM Education in UNESCO, presents UNESCO vision and strategies to engage young people into STEM.
2. Series of Books & Publications, focusing on the latest research findings studies in the field of Science Education.
3. Statistics & Policy, gathering figures and numbers on the status of science and Science Technology and Innovation (STI) in the world including Europe.
4. Gender, Girls & Women in Sciences, focusing on gender issues and ongoing initiatives to engage girls and women in science.

Regarding the engagement of young girls into science, **UNESCO** in collaboration with **UOC**, Scientix and H2020 GEDII project have been working together in the reported period for organizing a workshop event in Brussels in December 5th, 2017 (Month 26). The workshop will focus on 'Gender and innovation in STE(A)M education'.

In addition to the above, **UNESCO** also secured in June-July 2017, the participation of PERFORM during the forthcoming World Science Forum 2017 (Month 25) and the EuroScience Open Forum- ESOF 2018 (Month 33). In September 2017 (Month 23), **UNESCO** in cooperation with **TBVT** drafted and submitted a proposal for having PERFORM during the 15th Public Communication of Science and Technology Conference - PSCT 2018 (Month 30).

Furthermore in October 2017 (Month 24), **UNESCO** as part of the PERFORM consortium took advantage of internal major events including the 202nd UNESCO Executive Board (58 countries) and the 39th UNESCO General Conference (195 countries) to advocate and communicate on the benefits of the PERFORM project in engaging young schoolchildren in STEAM. **UNESCO's** lobbying actions targeted the UNESCO's Member states and especially the representatives of their Ministries of Education (MoE) who attended the above-mentioned major internal events.

Finally, in October 2017 (Month 24), **UNESCO and EUSEA** announced in liaison with **UOC** the dates of the PERFORM Final Conference that will be held at UNESCO Headquarters from 14-15 June 2018 (Month 32).

1.2.6 Work Package 6 (WP6): Dissemination and Outreach

During the reported period an effort to **produce communication materials** to enhance the impact of the messages generated by the project and its results was developed collectively and coordinated by **EUSEA**, as WP6 leader.

A second relevant goal of the period was to broaden the consortium connections with other networks such as **ECSITE, European Researchers' Night, and EC Open Day** organizers as well as the Beijing Association for Science and Technology at continental and global level. Last but

not least, during the period the initial actions to organize the final conference of the project were taken.

Task 6.1 Communication Plan and Tools

As for the communication plan implementation and development, based on the target audiences identified in the communication plan developed by **EUSEA** (D6.1 Plan for communication, dissemination and exploitation) a set of actions were developed during the reported period, and the production of specific communication materials was promoted together with a collaborative use of PERFORM social media (namely Twitter and Facebook) that led to the following results:

- **Production of 12 videos** that together with the 8 produced in the first period sum up to 20 videos available on the PERFORM [YouTube channel](#) describing some of the main features of the project and some of its preliminary results. Videos were produced by **SMS, UOC and TBVT** based on the suggested editorial guidelines and objectives identified and discussed jointly with **EUSEA**:
 - 1 video developed by **SMS** in February 2017 (Month 16) shows an example of trainings with students
 - 1 video developed by **UOC** in April and May 2017 (Months 18 and 19) present: (a) The talk delivered by UOC colleague Karla Berrens on May 31st, 2017 in Barcelona and awarded with the title of the best presentation in the event organized by UOC (https://www.youtube.com/watch?time_continue=14&v=6mlyJ5HoMV4), and (b) A video describing the data management in the open source library approach (<https://www.youtube.com/watch?v=gQgSqAdNjS8>)
 - 11 videos produced by **TBVT** between May and September 2017 (in Months 19 - 23) to explain the main features of the EW developed with the students to generate the expert PERSEIAs. The majority of these videos are part of the user-friendly version of the deliverable D 2.1., which is available at the PERFORM website under the Toolkit section for teachers, but also suggested for researchers. These videos introduce the workshops structure and guidelines, which are downloadable from the PERFORM website (<http://www.perform-research.eu/workshops-formats/>). **TBVT** also recorded video messages and audio tracks collecting *vox pop* from students in IES Castellbisbal and early career researchers. Since the material collected in these cases is in raw format its contents will be used for further edited videos concerning the results of the project). Additionally, during the reported period some of the videos produced in the previous period (M1-M15) were edited:
 - 4 videos produced by **TRACES and LAC** which show excerpts of the clownery approach to the PERSEIAs development (edited in February 2017, Month 16)
 - 1 video developed by **UOC** describing the data management in the open source library approach (edited in April and May 2017, Months 18 and 19) (<https://www.youtube.com/watch?v=gQgSqAdNjS8>)
- The Twitter and Facebook account were directly curated by **EUSEA**, who also promoted a collective use by the consortium members developing and distributing guidelines for social media use. Currently in October 2017 (Month 24) **PERFORM has 319 followers on Twitter and 608 likes on Facebook**. The approach is increasingly having an impact: more than 30% of increase in the Twitter followers and over a 45% increase in likes numbers on Facebook over the period January – October 2017.
- Launch of the first PERFORM newsletter in March 2017 (Month 17). **EUSEA** developed editorial actions defining the structure and topics of the newsletter jointly with **UOC**, assigning the articles to **TBVT, SMS, Traces, AJA, UAB, UoB, UOC, UoW and UNESCO** who wrote them, editing the articles and disseminating the newsletter through the web-

platform. All the partners took part in the writing process of the newsletter focusing on specific topics related to their role and tasks within the project.

Task 6.2 Building the community relations and outreach

As for the outreach and dissemination actions implementation and monitoring, based on the target audiences identified by **EUSEA** in D6.1 Communication Plan (Researchers, Teachers, Professional Research and Science Communicators, Policy makers), outreach activities were both suggested by **EUSEA** to different partners, and directly developed by taking part into international conferences:

- **14 main outreach events** (9 international and 5 national) attended by **UOC, UoB, UoW, TBVT, TRACES, SMS, UNESCO**, 3 of which directly by **EUSEA**, who worked on submitting proposal, organizing and convening sessions on some of the main European science engagement conferences in Brussels, Leuven and Porto in May/June 2017 (Months 19 and 20). A full list of the event is published on the [PERFORM website events section](#). The outreach events were selected and attended to reach the target audiences previously identified by **EUSEA** in D6.1 both at national level (countries where the consortium partners are based) and at European level. Moreover new networking activities were developed during the last months of this period by **UNESCO** and **EUSEA** that led respectively to the presence of the PERFORM project into two international relevant contexts such as:
 - (a) [World Science Forum](#) in Jordan in November 2017 (Month 25). The event is relevant to enhance the visibility of the project among policy makers, scientists and communicators.
 - (b) [Beyond the Obvious Conference](#) in Rome in November 2017 (Month 25) and is organized by Culture Action Europe, a network of artists and professionals in the field of culture. The event is relevant to increase the interdisciplinary connection of the project with performers and other artists or cultural stakeholders that might be interested in the results of the PERFORM project.
 - (c) European Commission Open Day in Brussels in May 2017 (Month 19). PERFORM was selected by the EC as one of the 15 participating projects. PERFORM has been invited to attend the event in May 2018.

Listed from the more recent one, the outreach events attended by PERFORM partners are briefly described below:

2017, April 23rd, II Neuroeducation International Seminar, Girona (Spain). **TBVT** presented PERFORM preliminary results and gave a short talk about the relationship of education and emotions in the context of PERFORM project.

2017, May 3rd, European Researchers' Night Coordinators' Day, Brussels (Belgium). **EUSEA** presented the training opportunities for early career researchers under development in the PERFORM project during the session at Directorate-General for Education, Youth, Sport and Culture.

2017, May 6th, **European Commission Open Day, Brussels** (Belgium). **SMS and UOC** presented the busking activities and the format for innovation in STEM education developed by the PERFORM project.

2017, May 16th, 2nd *Homo scientificus europaeus* Meeting, Barcelona (Spain). During the session on RRI and participative science **TBVT** presented the PERFORM project achievements.

2017, May 29th-30th, EUSEA Annual Conference, Leuven (Belgium). **EUSEA and SMS** developed a workshop to present the PERFORM project and experience the meaning of participation in

the development of STEM-based performances. The workshop included stakeholders from the science communication field from all over Europe.

2017, May 31st, UOC open day, Barcelona (Spain). A presentation in a TED talk style of the PERFORM contents and structure to the UOC Research Showcase was delivered by **UOC**. The presentation was awarded the first prize. Participation of **UOC** as speaker in a panel session on Open Data.

2017, June 27th, PESO (Public Engagement with Science Online)-A Research Workshop of the Israel Science Foundation, Haifa (Israel). **UoW** presented the preliminary results of the evaluation of the social media-based impacts of the performance events on young people's engagement in science.

2017, June 16th, ECSITE Annual Conference, Porto (Portugal). A session with the title *RRI: new collaborations for science communicators and researchers* was developed and held by **EUSEA, SMS and UOC**.

2017, July 8th, V International meeting SRUK (Society of Spanish Researchers in the United Kingdom), London (UK). **TBVT** took part into a roundtable on science engagement and presented a monologue titled *Brain and epigenetics*.

2017, July 11th, International University Menéndez Pelayo, 'The challenge of science: a look at international assessments', La Coruña (Spain). **TBVT** presented the PERFORM Project D2.1 related outcomes.

2017, July 19th-21th, The Big Event, Newcastle-Upon-Tyne (UK). **SMS** presented excerpts from busking sets developed during the PERFORM project to professionals in science communication. The goal was to enhance the participatory approach of new science busking activities under development in the PERFORM project.

2017, August 25th-28th, Shanghai International Popular Science Products Expo 2017, Shanghai (China). **SMS** presented the PERFORM project preliminary results and outcomes during the event jointly organized with **EUSEA**.

2017, September 22nd, Barcelona Peptide Therapeutics Symposium 2017. International symposium where **TBVT** presented the PERFORM Project to the audience, with a high proportion of ECRs, with the possibility of joining PERFORM Task 2.2.

2017, September 26th-27th, Science is Wonder-ful, Brussels (Belgium) and 29 September, Paris (France), Valladolid and Madrid (Spain) European Researchers' Night. **SMS, TBVT and TRACES** were all involved in the development of shows and activities in different locations where the European Researchers' Night was held.

During the reported period, **EUSEA** together with **UNESCO** and supported by **UOC** initiated the preparation of the PERFORM Final Conference in June 14th-15th, 2018 (Month 32) Through meetings via Skype and in person the preliminary programme structure and the date for the final conference were discussed and defined by **EUSEA, UNESCO and UOC**. The final decision on the date was taken in September 2017 (Month 23) and officially communicated to the consortium members in the beginning of October 2017 (Month 24).

The meetings to discuss the preliminary programme took place from February to April 2017 (Months 16 to 18). The first meetings between **EUSEA** and **UNESCO** in February 2017 (Skype meeting, Month 16), the second meeting was held with all the consortium members in Bristol in

April 2017 (Month 18) during the consortium meeting. A draft programme was discussed during the consortium meeting in Bristol in April 2017 (Month 18) and further developed in September 2017 (Month 23) when a set of actions to be implemented starting from November 2017 (Month 25) with the launch of the webpage section about the conference was also developed.

1.2.7 Work Package 7 (WP7): Ethics requirements

No further activities have been developed during the reported period.

1.3 Impact

Over the reported period an increase was observed in all the online communication channels.

Twitter followers reached the number of 319 (Month 24) from 229 (beginning of Month 16) whereas the Facebook likes had the following trend that also reflects a trend in the follower of the Facebook page of the project (see Fig. 1).

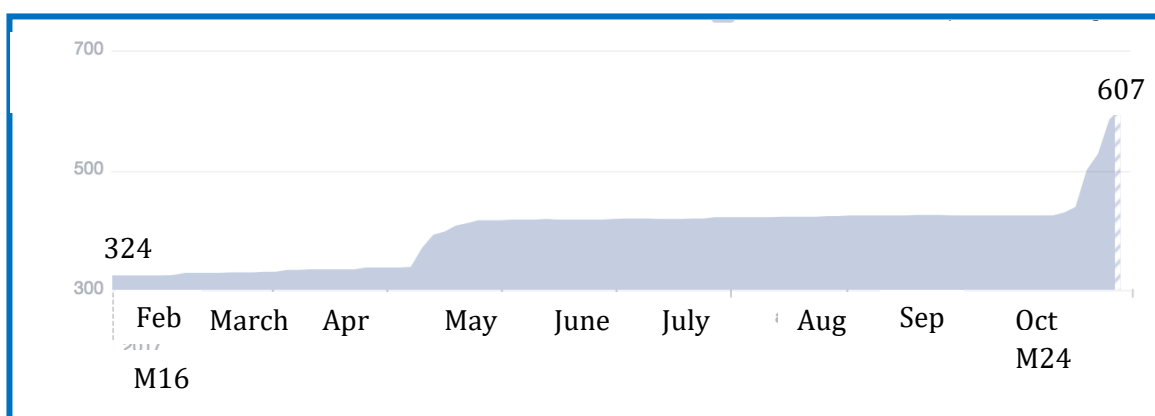
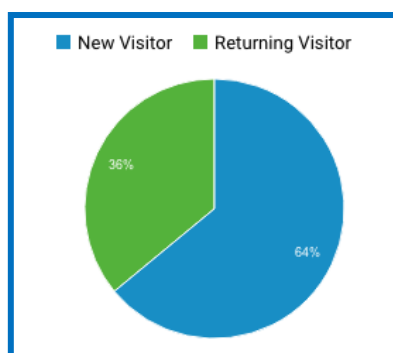


Figure 1. General trend of like number on the PERFORM Facebook page.

From 324 to 607 likes with a relevant increase in May 2017 (Month 19) during the period around the European Researchers' Night Coordinators day and the EU Institution Open Day as well as in October 2017 (Month 24) after the publication of the videos related to the teachers and early career researchers toolkit.

The visibility obtained during this period was also due to the participation to 14 outreach and dissemination events in Europe and outside that made it possible to start and develop collaboration with other networks and communities further described in section 1.2.6.

Website data show that (Months 16 to 24 consulting the to 3.685 sessions. were new visitors (see Fig. 2).



between February and October 2017 period) 2.405 users were active information published corresponding Among the visitors over two third compared to the previous period

Figure 2. General trend of users of PERFORM webpage.

2. Update of the plan for exploitation and dissemination of result (if applicable)

The development of the actions defined during the first period and the observation of their implementation during the last reporting period led to the following breakdown of future actions until May 2018 (Month 31) that precede the Final Conference month (June 2018). This has not to be considered as an update of the plan structure but a description of its implementations.

(a) Communication strategy development and implementation on social media and the web

Objectives:

- Increase the participative process of publication on social media and the webpage by the consortium partners
- Increasing the visibility through social media and webpage/s aiming at least to a + 30% by the end of the Period considered
- Making the final conference a communication event

Tools:

Preliminary results produced during the summer 2017 by the partners involved to develop participatory performances and toolkits are presented through:

1. Videos and documents published on the webpage and promoted through the social media and through the YouTube channel.
2. Production of articles by partners on the advancement and results of the project.
3. Facebook campaign both sponsored and not, organized promoting events of the Project such as training courses, publication of new results and materials, etc., and posting messages or news related to the project topic: innovation in education, Information/event/publication on RRI, Project partners activities etc...
4. Twitter constant activity with daily tweets and bi-weekly focuses on specific actions of the project.

Milestones:

November 2017 (Month 25): Launch and promotion of the Final Conference

December 2017 (Month 26): Launch of the PERFORM second external newsletter

January 2018 (Month 27): Publication of new communication material related to PERSEIAs (participatory performances) and toolkits. Publication the Final Conference final programme.

April 2018 (Month 29): Publication of communication material presenting processes and results produced by the project on the areas of interest for: researchers, teachers and students, museum facilitators and other communicators

May 2018 (Month 30): Finalization of the Final Conference communication team and actions

(b) Outreach and dissemination actions identification and implementation

Objectives:

- Broaden the number of stakeholders made aware of the PERFORM progress and results
- Partner with other RRI focused EU funded project (e.g. Nucleus, HEIRRI, FIT4RRI) to disseminate the PERFORM progress and results

Tools:

1. Briefs and digital fliers targeted to the different stakeholders explaining what's in PERFORM for them.
2. Articles to be published in different online platforms.
3. Pictures archive to be provided to stakeholders who want to publish information about PERFORM.

Milestones:

October 2017 – January 2018 (Months 24-27): Identification of stakeholders and their communication platforms and possible events to be present in. Participation to events or conferences to present the developing results of the project. Design of briefs and digital fliers for the different target audiences.

January 2018 -February 2018 (Months 27-28): New agreement for sharing contents of the PERFORM project on other EU funded projects platforms on RRI and stakeholders and network of public engagement.

March 2018 – April 2018 (Months 29-30): Presence at PCST 2018

(c) Final Conference planning and communication of contents

Objectives:

- Finalize the conference programme in order to make it a combination of sessions for project results presentations and engaging events based on performing arts and STEM education.
- Make the stakeholders community aware of the Final Conference contents, namely: early career researchers, teachers, performers/science communicators, policy makers involved in education policies.
- Defining all the communication actions to be implemented during the conference in order to produce effective communication material related to the event (video, pictures, press office plan for the event, social media management during the event, etc...)

Tools:

1. Digital brochures and banners to communicate the Final Conference dates, contents and the preliminary and final programmes.
2. Digital versions of the invitations to be sent to main stakeholders and institutions.
3. Brochures and fliers to be distributed by EUSEA and the consortium partners to their stakeholders' networks.
4. 1 short video teaser to be used to advertise for the conference.
5. Communication material (roll-up and banners, stickers, gadgets and other communication materials that might be useful to enhance the visibility of the main results of the project) to be defined with the coordinator and with UNESCO to be used during the conference.

Milestones:

October 2017 - December 2017 (Months 24-26): Final Conference general information launch through social media and webpage, mailing lists and project external newsletter starting the campaign to involve stakeholders to join the conference.

January 2018 - February 2018 (Months 27-28): Finalization of the Final Conference programme and strengthening the campaign to involve stakeholders.

March 2018 - May 2018 (Months 29-31): Production of the communication material for the conference.

3. Update of the data management plan (if applicable)

During the reported period UOC has held several meetings with the UOC library services in order to implement the Data Management Plan. The Plan itself (D1.4) has not needed updating.

4. Follow-up of recommendations and comments from previous review(s) (if applicable)

#The project website should be more developed and it should be more attractive for final users. Videos on the website should give more time for the students' feedbacks on the events they have participated and impacts they have received (WP6)

The project should enhance application of social networks to reach the pupils and promote STEM education among youngster (WP6)

#The final user for the project activities should be more involved (i.e. to address larger number of school teachers) (WP2, WP3)

#The consortium should develop the contacts with new stakeholders and new final user of the project (WP5)

#The logo of the EU should appear in every publication (WP1, WP6)

#The consortium should think about the sustainability of the project after the EU funding (i.e. to plan the set of smaller-scale project with financial support on the local or national level, in peculiar educational environments) (WP5)

5. Deviations from Annex 1 and Annex 2 (if applicable)

5.1 Tasks

Not applicable in this reporting period.

5.2 Use of resources

The PERFORM General Assembly agreed in the project intermediate meeting in Bristol in April 2017 (Month 18) in a pm redistribution in order to address **TRACES** underestimated budget and the reallocation of responsibility in Task 2.2 and Task 3.3, as follows:

- **TBVT** transferred 2pm to TRACES
- **UOC** transferred 1 pm to TRACES
- **AJA** transferred 1 pm to TRACES
- **UoB** transferred 0.7pm to TRACES

UoB engaged a videographer in Barcelona to capture video footage of the teacher training delivered by **TBVT** in July 2017 (Month 21) – expenditure of €751.31 that was not anticipated in the DoA. This video footage served two purposes. Firstly to give an insight to the **UoB** team about how the training was received in the room and how the activities worked, in order to inform the development of the further teacher training in Spain as well as the trainings in the UK and France. Furthermore, as the training was delivered entirely in the Spanish language, and the **UoB** team is not Spanish speaking, it would have been difficult for them to do that in person. Additionally, it is anticipated that some of this footage will be able to be used for the toolkits for teachers that WP3 will produce.

In September and October 2017 (Months 23 and 24) **SMS**, following the schools' recruitment, delivered detailed discussions with teachers, formats and timetables ratified with participating schools within Task 2.2. A requirement in UK schools of financial support raised to provide teacher cover was highlighted in this period. This support was required because the student participant numbers required in each school are half the size of a full class. A sum of €600 was agreed to be provided by **TVBT**.

5.2.1 Unforeseen subcontracting (if applicable)

Not applicable.

5.2.2 Unforeseen use of in kind contribution from third party against payment or free of charges (if applicable)

Not applicable.