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Executive summary

This deliverable provides an overview of the activities done by the DESIRE partners for tools, outreach to schools and science museums and events. These activities consisted in the set-up of a public platform and organisation of discussion events for the several target audiences of the project.

The first section provide a description of the DESIRE public platform set-up to inform the general public on the activities carried on by the project and. It is also used for the Online Discussion Events were a forum tool is available.

The next section includes the protocol of Online Discussion Events that was elaborated in a collaborative way by the partners of the DESIRE consortium during their second Management Meeting. It provides the framework for partners to organise their own event online and the topics to be tackled.

The following sections gathered the reports from all the discussion activities carried on for teachers, project managers, science events professionals, science museums and communicators and policymakers.
1. Public project platform

The public section ([http://desire.eun.org/](http://desire.eun.org/)) is set up by the EUN and serves as a platform for online discussion events (called Community of Practice in the proposal). The website has 7 different sections (Home, About, Online events, News, Publications, Contract us, Past events) which will be presented below. The lighter green in the menu indicates which section the visitor is viewing.

![Menu](http://desire.eun.org/)

Figure 1: Menu

1.1. Home

The Homepage of the DESIRE portal has five text boxes which contain short descriptions of the portals sections (About, News, Online event and the Publications section). The design of the Homepage intends to give the visitor a good overview of the content of the website.

3.1.1 Sign In

The ‘Sign In’ text box of the Homepage, explains how to sign in to an ODE, a necessary step to be able to provide feedback during the ODE, upload documents and vote on comments posted by other participants.

The ‘Sign In’ information is available in several sections of the website.

![Registration link](http://desire.eun.org/)

Figure 2: Registration link ([http://desire.eun.org/](http://desire.eun.org/))
When following the link named ‘create account’ the participant will access a page similar to the picture shown below.

If the participant has already participated in online activities of European Schoolnet, it is very likely that he/she already has an OpenID. In this case it is possible to use the first link named “Reuse an existing EUN OpenID”. If the participant does not have an OpenID account he/she simply follows the second link named “Create a new EUN OpenID”. The last link can be used if the participant already has an OpenID which he/she has used, but not in European Schoolnet activities.

1.2. About

The second section of the portal is the ‘About’ section. It contains information on the project objectives, the DESIRE project’s funding institution and the organisations constituting the DESIRE consortium. Links to each of the partners’ individual websites are available.
1.3. Online events

If a visitor wish to know more about the ODEs that are taking place or when they are taken place it is possible to visit the section called ‘Online events’.

3.3.1 How to participate

The ‘Online event’ section contains a ‘how to participate text box’ which explains how to proceed for the registration of an ODE.

![Figure 5: How to participate](image)

If a participant has problems registering they are have the option to contact EUN team members directly.

3.3.2 DESIRE Online Discussion Events

The ‘Online events’ section has also a textbox (upper right box) that explains what the ODEs are about and the main subject of each of the events.

3.3.3 Sign In

Confer section 3.1.

3.3.4 Pre-registration

The section also gives stakeholders the opportunity to leave their contact details in the pre-subscription service and be informed about relevant upcoming events for their target group.

3.3.5 Moderator status and participation of stakeholders

ODEs are often lead by a moderator that serves the purpose of posting questions and keeping the discussions alive by commenting and summarising the content. The moderator is provided with moderator access to the portal by the EUN, in order for him/her to moderate the ODE.

When the partners have chosen a moderator and the moderator has registered on the portal, the name and a short biography of the moderator is send to the EUN who will help setting up the ODE page and take care of the configuration for the moderator status and inform the partner when it has been approved.

The moderator tools are explained in the document called ‘DESIRE ODE guidelines for moderators’ (see Annex I).

In order to facilitate the registration and participation of the stakeholders the EUN has also provided at short guideline for stakeholders (See Annex II).
1.4. Online Events sub-menu

If an ODE is open for participation a sub-menu will appear when pushing the menu-bottom named ‘Online event’ (see below). If an ODE is open the participation, it is possible to enter the event by clicking directly on the name appearing in the sub-menu (See example below).

![Image of DESIRE Web Portal](image)

**Figure 6: How to enter the online event**

The ODE page includes a forum giving users the possibility to leave comments and vote on other participants’ contribution to the discussion. Bellow you find an example of an ODE page:

![Image of ODE page](image)

**Figure 7: Example of an ODE**

1.5. News

The ‘News’ section has two textboxes. The text box called ‘Events’ gives an overview of the dates of future and past events. The ‘News’ text box updates on the latest progress or events of the project. In the example below the news is announcing the questionnaires for teachers, project manager and policy makers.
1.6. Publication

The ‘Publication’ section includes the discussion events reports the projects leaflets and opening letter.

1.7. Contact us

This section of the webpage provides contact-details of the DESIRE consortium.

1.8. Past events

Finally the ‘Past event’ provides an overview of all the past discussion events organised on the portal. The ‘Past events’ section contains 4 text boxes, explained below.
3.7.1 How to participate
Confer section 3.3.1.

3.7.2 Past Online Events
The ‘Past Online Event’ text box explains that the direct links to the ODEs organised on the DESIRE platform are available here.

3.7.3 Sign In
Confer section 3.1.

3.7.4 Finished discussion events
The text box named ‘Finished discussion events’ contains a table with an overview of all closed ODEs and a direct link to all of them. The closed ODEs remain accessible to ensure that stakeholders can view the discussions. The table divides the online discussion events into five categories, which correspond to the five target groups of the project.
2. DESIRE Online Discussion Events Protocol

+ add how the forum functions should be used to organise the ODEs

2.1. Introduction

The consortium discussed a number of elements necessary or desirable for the introduction of the Online Discussion Events:

- The introduction should be already online before the start of the event.
- Participants should be invited to log in whenever they want during the 3 days + announce 2 time slots when there will be life activity (the moderator is present and answering questions live).
- Definition of dissemination & exploitation in the DESIRE project will be provided
- Introduction on the topic that will be discussed and on the moderator/expert will be given
- Poll in the introduction
- Statement on the topic of the ODE
- each day, brief intro on the topic of the day

2.2. Online Discussion Events

The consortium discussed a number of elements necessary or desirable for the Online Discussion Events:

- answers to the poll with some statistics related to the topic of the event
- each day 1 or 2 sub-questions are unveiled
- the moderator introduces quickly the participants, type of role they have
- in each ODE, boxes with short biography (one sentence) on key participants/experts even if ODE still open to additional participants.

2.3. The role of the moderator:

The role of the moderator is to:

- Guide discussion, react to comments from participants
- Being online at least a couple of time to animate the ODE

2.4. First session

How much information from European and national projects results do you receive? How are you usually informed of these results?

Project Managers

DAY 1 - you as a user:

- What is your favourite channel of dissemination to get information? Why?
  * The moderator should have background info ready to feed the discussion. e.g. providing statistics on specific channel (social media,).
- What channel does not work for you? Why?
- Which channel do you imagine as the best one to get information?
  * Which channels do you prefer for these specific content/resources?

Newsletters, portals, emails, RSS, Skype, Google ads, networking, conferences, etc.
DAY 2 - you as a producer
- Which was your best experience disseminating results?
- What are your worst experiences, worth results to disseminate?
- Which are your criteria to define the success of a dissemination strategy?
- How do you evaluate the impact of the dissemination actions?

DAY 3 - dissemination strategy
- When do you carry out the dissemination activities in the life of your project (beginning, end...)?
  Why?
- How do you adapt your dissemination strategy according to the target group?
  * choice of channel
  * type of content
- What kind of information/results/resources did you think was important to disseminate in the project(s) you are managing?

Teachers

DAY 1 - you as a user
What is your favourite channel of dissemination to get information? Why?
  * The moderator should have background info ready to feed the discussion. e.g. providing statistics on specific channel (social media, ...).
- What channel does not work for you? Why?
- Which channel do you imagine as the best one to get information?
  * Which channels do you prefer for this specific content/resource?

DAY 2 - Identify key challenge
- What would you advice to make sure project results are better disseminated to teachers have create better disseminating results?
- What is your worst experience, of research results communicated to you (science teacher)?
- Do teachers have any technical barriers to access project results? (E.g. lack of access to technology, language skill, time or interest from teachers?). What are the facilitators?
- If barriers are identified, what could improve the situation?

DAY 3 - Find the way to a teacher’s attention
- What kind of first-hand information do you think is important to outline to catch teachers’ attention the first time a teacher hear about a new project and its results?

2.5. Second session

What do you know about specific European and national projects? By means of which strategies have you been informed of these results? What impact do these results have in your practice?
DAY 1 - Awareness/knowledge on specific dissemination products (use examples given in the 1st session).
- Do you know about this publication/website/newsletter? How did you know about this specific dissemination products?

DAY 2 - Needs & Lack/overload of information
- What kind of information are you looking for?
- When you get to know this specific result (project, event, and resource), what kind of info were you looking for?
- What kind of approaches do you use to get information/results (contact author, networking...)?
- What is strategy to select/sort the information you receive?

DAY 3 - Use of findings/results/resources in your practice (finding out if the results are used but not how)
- Are the results useful/inspiring for your work?
- Did you use the results in your work (teachers: in classroom; policy makers: in def. of curriculum; project managers: in future proposal). How do you store the information?
3. First Online Discussion Event for teachers

3.1. Introduction

The first teacher Online Discussion Event took place in the period 11-13 July 2012 and was moderated by Carlos Cunha, teacher of Physics and Chemistry at Escola Secundária Dom Manuel Martins, in Setubal, Portugal.

During the three day event teachers were invited to discuss how they are informed about European and national science education project results. The following sections contain summaries of the discussed themes each of the three days and the outcome of the discussions.

3.2. Summary of the content of the discussion

DAY 1

The first day of the 1st teacher online discussion event had a focus on the various dissemination channels that teachers can access to get results from Science Education projects. To structure the discussion, we mentioned different types of dissemination channels, and invited teachers to point out the channels they prefer to use and why. We also asked for more information on the channels teachers perceive as not working.

This first day had a high level of participation and there were especially high interest in discussing the use of Social Media tools as dissemination channels. When discussing their use of Facebook, the majority mentioned that they use Facebook for fun, in informal situations. Nevertheless, some teachers have used it in projects with their students.

Most teachers said they prefer twitter, since “You can receive information as an audience (if you want) or, on the other hand you can just send information” and because “you can choose the kind of information you want to receive. It is very easy and comfortable to use.”

Smartphone news applications was also mentioned as a good tool to disseminate information, they have the advantage of mobility but as one of the participants mentioned “smart is used quite often, but not at a very large scale because of the relatively high cost”. It probably will be a good dissemination tool in a near future, if they are not replaced by tablets.

The participants were also invited to discuss Traditional media channels, but here the participation was low. Of the 4 questions proposed by the moderator, only 2 replies were posted by teachers. Participants were invited to mention why they did not participate in the traditional media discussions. This way we could identify if the cause was due to a confusing structure of the discussion event with too many threads or due to an uninteresting subject for them?

Day 2

The focus on the second day of the event was to discuss what teachers thought could create better dissemination results when reaching out to teachers with information on national and European science and math project results. However, more than pointing “Ways to improve dissemination”, participants referred to the difficulties and reasons for low dissemination of information and results. Some mentioned that if a teacher is not motivated to new methodologies, he will not look for information about it.

Some teachers mentioned the necessity for project managers to try to find new ways to reach teachers and it was suggested that teachers who go to project workshops and conferences should have the obligation of participating in meetings with local teachers to disseminate information learned from the conferences and workshops on the different projects.

A good example was referred: “In Romania, every school has a teacher who is a European information multiplier (I am in my school). It’s actually a network of multiplier which advises and
inform about European projects and International Relation.” - It could be a good idea for other countries.

Some participants expressed difficulties with understanding the languages used in the workshops: It was easier if workshops could be in their mother tongue.

**Day 3**
The third day of the online event tried to determine key information to catch teachers’ attention when disseminating project results.

It was mentioned that communication and dissemination of new and inspiring methodologies and resources are more interesting and effective for teachers if they are presented by peers.

“It is important to support the effort of teachers that are motivated to spread out the word on innovative teaching methods and invest in professional development of teachers including in-service training.”

It was also said that new methodologies should be at the national curricula of all the European countries.

A factor mentioned to be important to motivate teachers to apply new methodologies to their teaching is the stability of teachers. It is considered as an advantage when a teacher works in the same school over long periods. Teachers can this way find it meaningful to try out new methodologies as they are able to follow the results of the changes of practice on their own students along the years.

Finally, it was mentioned that if projects encourage competition among teachers, it could work as an encouragement for the participation and application of new methodologies, especially if the prize is teaching equipment for the school: “it was a project last year about trans-disciplinarily and teachers were invited to participate at a competition. Award: equipping schools with labs multi-touch: 8 / country. Thus, we won multi-touch tablets for students. It was very motivating ...”

### 3.3. Feedback on the first Online Discussion Event for teachers

**Problems encountered:**

- Some viewers might have hesitated to participate due to the language barriers as teacher invited were coming from all over Europe. In other cases the point of views of some teachers had already been formulated by other participants.
- Some threads were not so successful, while other threads captured all the attention of the participants. It might be because we provided too many subcategories which made it difficult for the participants to have an overview of all the questions.

**Positive aspects observed:**

- Exchange of good practices and deep reflections on the topic of dissemination on the part of the participants.

**Improvements required:**

- Number of participants could be higher: the dates of this event might have not been suitable since it has taken place during most European teachers summer holidays. We expect the ODE in September/October to be more successful.
3.4. Participation

Here are some statistics on the first Online Discussion Event for teachers:

**Number of invitations made** (if possible, please specify typology of invitees):

- Total: 2000

**Target type:** Science teachers as main target but also teachers of other disciplines

**Number of actual participants:** 13

**Average number of posts per day:** 28

  - **Number of posts in Day 1:** 44 (11 participants + moderator)
  - **Number of posts in Day 2:** 21 (8 participants + moderator)
  - **Number of posts in Day 3:** 19 (7 participants + moderator)

**Ratio posts/participant per day:** 3/1

**Silent viewers per day:** 1274

Along the three days event, there were 93 posts and about 753 views. The high amount of views might be interpreted as the result of a successful dissemination of the event. We believe that some viewers might have hesitated to participate due to the language barriers, since we had invited teacher from all over Europe to participate in the event and in other cases because the point of views viewer had already been formulated by other participants. The distribution of the posts and views per day is shown on the next figure:

![First Online Event](image)

**Figure 10:** First Online Discussion Event - Number of posts and views

The first day had the highest number of posts, as shown in the next figure 11:

![Number of Posts](image)

**Figure 11:** First Online Discussion Event - Number of posts per day

The day with more views was the second day:
Figure 12: First Online Discussion Event - Number of views per day

The statistics from this first teacher Online Discussion Event show that the event had a reasonable participation level from which we can draw useful ideas and experiences of the participants that can contribute to the identification of better dissemination practices in future science and math projects.
4. Second Online Discussion Event for teachers

4.1. Introduction

The second teacher Online Discussion Event which took place from 19 to 21 September 2012 and was moderated by the same expert than the first event, Carlos Cunha.

During the three day event teachers were invited to discuss how they use project results and if they use both resources and methodology information from project results. The following sections contain summaries of the discussed themes from each of the three days and the outcome of the discussions.

4.2. Summary of the content of the discussion

Day 1

On the first day of the event teachers discussed which STEM education projects they know. To help the participants, the moderators mentioned a wide range of projects to be commented. The purpose was to see if teachers remember specific results from projects such as publications, the website, virtual tools or had subscribed to any of the newsletters providing results from European or national STEM projects.

The first day there were 22 responds to the questions posted by the moderator and 180 views.

Some teachers mentioned that they did not know about most of the projects but highlighted some other projects in which they had participated. Others had participated in some of the highlighted projects but said that in some countries, the language is a barrier for the participation of students and teachers.

Tetsa mentioned that "All this projects opened for me new horizons, inspired students to study science and technology" what according to Carlos Cunha well expresses the feeling most teachers who has participated actively in STEM projects have.

Day 2

On this second day, teachers where invited to tell what they think projects results are good at providing. The questions especially focus on how appropriated the project result are at explain how the methods/tools can help teachers reach the goals of their teaching plan more efficiently.

During the discussion teachers focused much on the resources, information and data that teachers search for, for their teaching.

Teachers usually search for videos, applications, experiments and presentations that can help them on their day-to-day teaching. Some projects and sites were mentioned as sources of good materials, such as CLIMANTICA and Xplore Health, Cosmos, EU-HOU, ITEC, etc.

When it was discussed if the materials they find from project results are the right materials - it was mentioned that the main difficulty most teachers face, is to choose among the vast amount of information available on the internet.

The second day’s participation was a little lower than yesterday. There were only 12 posts and 85 views.

Day 3

The last day teachers were asked to tell about the tools and methods from science education project that had been useful for their teaching practice by giving concrete examples of project results that have been useful as well as project results that has not.

The 3rd day the discussion focused a lot on the resources from the internet for teaching.
Teachers mentioned that these resources are "fresh, immediate, with excellent diagrams and drawings". Several EUN projects were mentioned, such as Xplore Health, Nanoyou and InGenious.

However, "the importance to have supporting guidelines for teachers and also training to make sure teachers are prepared to handle the resources" was an aspect that is always referred to as important, but they should be developed by science teachers. It was also mentioned that teachers will always be "interested in any project that has clear and simple 'step by step' guidance".

One teacher also said that the resources used by teachers are "fun and inspiring activities (...) to motivate students and raise their interest in science. (...) The students enjoy learning using these tools either individually using laptops or as class activity using interactive whiteboard and they benefit a lot from the immediate feedback or self-assessment."

Almost all participants agree that these resources increase the motivation and interest of students for studying sciences, and improve the development of skills.

4.3. Participation

Here are first some statistics on the first Online Discussion Event for teachers:

Number of invitations made (if possible, please specify typology of invitees):
Total: 2000
Target type A: science teachers

Number of actual participants\(^1\) (if possible, please specify typology of invitees):
Total: 12
Target type A: 12

Average number of posts\(^2\) per day: 20
- Number of posts in Day 1: 26 (11 participants + moderator)
- Number of posts in Day 2: 15 (8 participants + moderator)
- Number of posts in Day 3: 19 (9 participants + moderator)

Ratio posts/participant per day: 2/1

Silent viewers per day: More than 100 in some threads

![Second Online Event](image)

**Figure 13:** Second Online Discussion Event - Number of posts and views

The first day had the biggest number of posts, as shown on the next figure:

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\(^1\) By the word participant, we refer to external participant, meaning not the moderator.

\(^2\) Including posts from the moderator and the “Des Spolse” character.
Finally, the day with more views was the second day:

Due to the lower participation in this second event the team as considered it necessary to take some measures to increase teacher participation on these events.

4.4. Conclusion

The second online event went fairly well for a period where most teachers are already working on their schools. The participation level was lower than on the first ODE. Nevertheless the quality of the posts was very good.

In fact, along the three days, the ODE had 48 posts along the questions threads and there were about 370 views of all these post, showing that the subjects that were discussed were interesting.
5. Third Discussion Event for Teachers

5.1. Introduction
The partner in charge of collecting data from teachers and organising outreach activities targeting them decided to run an additional discussion event to accumulate more qualitative data from this key target audience. A face-to-face workshop was organised for teachers at the First inGenious academy in Bad Hofgastein, Austria from 19 - 22 October.

5.2. Content of the discussion
The workshop was organised as an open discussion and was moderated by Agueda Gras-Velazquez, the head of science education programme at EUN. Several dissemination channels were discussed, giving the opportunity to teachers to provide feedback on each of them:

- Teachers meetings
The teachers’ workshops, events and meetings in general have been identified as one of the most effective way to share information on the latest results from science education projects. These networking activities allow butterfly effects in terms of dissemination.

- Competitions for teachers
European or national competitions for teachers were seen by the teachers involved in the workshop as a very good way to learn about activities and results carried out by science education projects. An example given was the inGenious project website.

- Facebook
The social platform Facebook was perceived as a channel allowing good viral effect and considered as a fun channel to use. A negative point identified by teachers was the fact that getting information from science project on Facebook requires being very active on the platform. Another inconvenient is that Facebook is also often used by teachers for their private life and it is not always easy to differentiate that with the professional activities and contacts.

- Online information updates
Teachers involved in the workshop believe the emails, newsletters and RSS feed can be very useful to receive science education projects results. However they believe Google Ads are not effective to find the right information.

- Google search engine
The search engine Google was mentioned as a channel commonly used by teachers and students to get information on science education project, to find resources and information. However, teachers mentioned the negative aspect of this channel being the privacy issue for students and the relative accuracy of some information found.
• Governments, national education authorities

Teachers also talked about information received from governments and national education authorities. On that channel, they explained that an ideal situation would be that each country runs a unique national website or organism to disseminate results of science education projects. They also suggested that information should be given to headmasters first, that would act as intermediate with the teachers of its school.

• European portal on science education

Portal intended at science educators gathering information, results, resources and publications from science education projects in one place has been identified as a very good channels by the teachers involved in the workshop. The Scientix portal was mention as a good example for that.

• Academic publications

Very few teachers mentioned the results of academic research as a channel easy to use to receive useful information on the results of science education project.

• International or EU teachers TV

An idea suggested by the teachers was to create an international or European television for teachers. The idea would be to use an existing education portal such as inGenious or the social website YouTube to create a channel gathering all the videos existing for teachers in one place.

5.3. Conclusion

The conclusion of this workshop was formulated by the teachers with the help of the moderator. They concluded that using one of the dissemination channels independently is not very effective for teachers to keep updated on the latest resources, methods and materials that are made available by science education projects. They have suggested that teachers benefits better from these innovation resulting from science education projects if they combine online and face-to-face dissemination channels and events. Another point mentioned was that the information should be communicated by project managers and science communicators in simple way and format.
6. First Online Discussion Event for Project Managers

6.1. Introduction

The first project managers' Online Discussion Event took place from 17 to 19 September 2012 and was moderated by Marisa Hernández, researcher in Science Education at the Centre for Research in Science and Mathematics Education (CRECIM), in the Universitat Autònoma of Barcelona, Spain.

During the three day event project managers were invited to discuss how they are informed or find out about European and national science education project results and how they communicate or disseminate project results. The following sections contain summaries of the discussed themes each of the three days and the outcome of the discussions.

6.2. Summary of the content of the discussion

Day 1

The first day of the 1st project managers' online discussion event had a focus on the various dissemination channels that project managers usually use to get results from Science Education projects. To structure the discussion, different types of dissemination channels were mentioned, and project managers were invited to point out the channels they prefer to use and why.

This first day had a high level of participation and there was almost the same interest in discussing the use of Social Media tools (22 posts) and the use of other more traditional dissemination channels (19 posts).

Regarding social media channels, Facebook was considered by some participants a useful channel to make projects known by teachers, to exchange and get to know the latest news from education projects, to announce an event targeted at teachers or to invite them to participate in a project.

“I think Facebook is a powerful channel to make your project known by teachers. Many of them are using Facebook to exchange and get to know the latest news from education projects”

Nevertheless, this channel was not considered too appropriate to disseminate other kind of project results, such as resources or tools. Moreover, some participants consider that it would not be advisable to maintain a Facebook profile parallel to the project’s main website.

“My experience on Facebook as a dissemination channel with teachers is that it does not work. Traffic from Facebook towards project pages is negligible”

There has been some discussion on how to take advantage of this channel to reach different audiences.

Twitter was also considered a channel to bring traffic to websites of education projects although some reservations about this channel were also expressed:

“I would however not count on Twitter as unique channel to disseminate results of science education projects. It is very difficult to assess the real impact of a Twitter campaign on the engagement of teachers in projects”

LinkedIn was suggested by one participant as a useful channel to get to know aspects of projects that do not usually appear in more established channels.

There was also a brief discussion devising a social network just for project managers that would allow connecting research groups, sharing documents, interacting with others in an asynchronous and synchronous way, etc.

Regarding more traditional dissemination channels, the discussion was mainly focused on the attendance to face-to-face events such as conferences and workshops in order to network and find
out about project results and future project developments. Another reason that was argued to opt for face-to-face events is to provide stakeholders all the necessary background to understand and find project results usable:

“Meeting teachers’ face-to-face enables to engage them in a more sustainable way as it seems to be easier to participate to a project when faces can be put under names... It is essential to get teachers familiarized with your projects and provide them with the background information that will engage them on the longer term.”

Obstacles for dissemination such as the huge amount of information that flows in the digital era were highlighted by several participants. In this case, face-to-face events were also considered key to facilitate keeping up to date around certain strands. Newsletters are also appreciated to get relevant information related to your field. However, some gaps still seem to exist for project managers concerning the dissemination of information from projects funded by the European Commission.

Other participants explained some dissemination strategies they used in particular projects such as using advertorial space from various leading news media to show the core messages of the project in those leading dailies.

“This dissemination measure provided great value for money in view of the relatively low cost of those advertorials and of the sizeable circulation of those traditional media outlets”

Some participants consider that a good dissemination strategy is to use both social media channels and traditional dissemination channels to guarantee reaching stakeholders.

“Only some teachers are reached [with Facebook] as a large part of them are using more traditional channels like newsletters or specialised websites. It should then be used with a combination of other channels”

Day 2

During the second day of this event, project managers discussed the best and worst experiences concerning dissemination of project results. Some of the best experiences were related to the involvement of stakeholders as ambassadors, steering committee or national coordinators, so that they could also spread the word of the project by organizing information days to explain to other schools the outcomes of the project, or communicating the activities and results of the project to their colleagues and media in the language of their country, or sharing their experiences on a blog.

“From our experience, one of the best ways to raise awareness of teachers is word of mouth”

Other participants agreed on the importance of the role of this first group of teachers to reach the target audience and create a wider network.

“The teachers knew who to contact and what channels to use to get the message across, however there seems to be no ‘general blueprint’: what works in one country, may turn out be quite inefficient in another. The local knowledge is the key”

Other good examples have to do with disseminating project results in the framework of workshops or seminars for in-service professional development purposes, out of schools or within schools. However, some participants agree that these workshops are time-consuming and might not be a suitable format for any kind of project.

“We have tried workshops in schools and found that albeit rewarding were very time consuming. Having said that, this is a kind of format that I suspect will not work for all projects. You really need to talk to the teachers’ interests”

There was also some discussion about the need for and types of incentives (remuneration, recognition, network, training, etc.) for teachers or other stakeholders involved in the project.
Another innovative experience consists of including podcasts in a project website for dissemination purposes.

“Best experience is a podcast on a website. It prompted a lot of enquiries about the project”

The participants have been also discussing measures to improve the dissemination plans of a project. Again, the main point focused on involving some stakeholders from the beginning of the project or involving them on dissemination strategies as intermediate stakeholders.

“It is quite common in the UK to have a steering committee for projects where stakeholders are kept up to date with the developments of the project and can give their opinion. This seems to me the best way at regional/national level”

Some participants also elicited their doubts concerning the number of teachers you can reach in practice using this strategy.

“I think it is important to select which teachers can actually play this role with their peers. The other question is how far will this method go? how many teachers can you reach this way?”

Finally, the issue of the criteria project managers use to evaluate a dissemination strategy was discussed. There has been some debate around considering (or not) exploitation of results as an indicator of the effectiveness of a dissemination plan. This is one of the key issues that are still under discussion.

“I think it is important to define what is evaluated when assessing dissemination activities: number of people that are aware of the projects? number of people that actually use the results in their practices or participate? Number of visits on a project website is a very common criterion used to evaluate the results of a dissemination strategy but it is not always representative of the use of your results by teachers. It is often difficult to get information from all the teachers that are involved in a project. From my experience, it happens very often that teachers have been using your resources for a long time without telling the project manager”

**Day 3**

The third day discussion was focused on factors that are relevant to catch the attention of stakeholders. Issues such as timelines for disseminating project results, appealing formats and contents to be disseminated were tackled during the 3rd day.

Regarding timelines for dissemination, different points of view arose in the discussion. Some participants pointed out that normally it is risky to try to disseminate project results that are still under development because some stakeholders might lose interest if they do not find these results useful, applicable or fully understandable.

“It depends of the project of course, but I think normally there is little to disseminate in the first half of the project, and the results start to be interesting for teachers during the second half. Trying to do dissemination before you risk losing people’s attention as the "product" or relevant result of the project is still under development. The public is interested in something they can already use, apply or fully understand”

Other participants suggested that one good solution to promote further dissemination after a funded project finishes is to create/use portals centralizing all the project results.

“Some very good tools and resources available on websites of finished projects are not disseminated anymore as the funding has stopped. One solution is to create portal centralising all these project results like the Scientix portal (www.scientix.eu)”

Other strategies relate to a "low intensity" dissemination involving stakeholders during the whole lifetime of the project in order to establish stronger relationships with stakeholders, and to enhance the chances of influencing future decisions through research.
Concerning content and format of dissemination, all the participants agreed that the way project results are communicated should be adapted for different stakeholders. According to this, the focus, length, language and style of the documents or other channels that are used for dissemination should be different for each target audience.

“For policy makers, you may talk about the more general targets and long-term aims. For teachers, you need to tell them why is it important now and how can they use the content now. Quite different!”

Finally, one participant contributed to the discussion mentioning that an attractive title or strong tagline is all important in catching people’s interest for successful dissemination.

### 6.3. Feedback on the first Online Discussion Event for Project Managers

**Problems encountered:**

- 12 and 4pm, moments when the moderator posted further questions, were not actually moments with higher number of participants discussing the threads. However, participants posted comments in different threads at different times.
- Some threads were not successful at all, while other threads captured all the attention of the participants.

**Positive aspects observed:**

- Excellent help from EUN solving the problems encountered with the platform, and rising fruitful discussion and interesting ideas.
- Exchange of good practices and deep reflections on the topic of dissemination on the part of the participants. Some participants or viewers let me know that this exchange of ideas and experiences had been an interesting event to them and a topic that is worthy of discussion.
- Summaries of each day’s discussion have been appreciated by some participants to keep up to date.

**Improvements required:**

- Platform: setting-up of permissions of all participants must be done in advance. Some emails should be sent to participants summarizing the essential information to be able to contribute to the discussion (i.e. similar to the guidelines for participants but a more reduced version). Subscription to threads has been considered by some participants as a powerful option to follow the discussion.
- Participants’ involvement: we should carefully think about the content of the 2nd ODE to make it more appealing. For instance, instead of asking so many questions we could provide some interesting information about dissemination and invite them to comment on that. This requires a previous search and inquiry on the part of the partners and/or moderators. Moreover, we might focus on fewer subcategories and threads per day in order to attract all the attention towards fewer interesting and wide topics each day.
- Number of participants: the dates of the 1st ODE might have not been suitable. Apart from that, in the 2nd ODE more people from other institutions should be invited.
6.4. Participation

Here are some statistics on the first Online Discussion Event for Project Managers:

**Number of invitations made:** 34

Target type A: 20 Project managers involved in science education

Target type B: 14 Academic field researchers on science education

**Number of actual participants:** 12

Target type A: 10

Target type B: 2

**Average number of posts per day:** 27

- **Number of posts in Day 1:** 42 (6 participants + moderator)
- **Number of posts in Day 2:** 26 (8 participants + moderator)
- **Number of posts in Day 3:** 12 (4 participants + moderator)

**Ratio posts/participant per day:** 2/5

**Silent viewers per day:** More than 100 in some threads

Along the three days event, there were 80 posts. The distribution of the posts per day is shown in the next figure:

![Number of posts per day](image)

As shown, the first day had the highest number of posts and this number decreased day by day. However, the statistics from this first project managers ODE show that the event had a reasonable participation level from which we can drag useful ideas and experiences of the participants that can contribute to the identification of better dissemination practices in future STEM projects.
As shown in the next figure, there were also hundreds of views of each category (Day 1, Day 2, and Day 3):

![Number of views per day](image)

**Figure 17: First Online Discussion Event for Project Managers - Number of view per day**

The high amount of views might be interpreted as the result of a successful dissemination of the event. Some viewers might have hesitated to participate due to:

- Time constraints, since the event took place in a period of the year when many project managers were attending conferences, on holidays or preparing the academic year.
- Technical difficulties that arose during the 1st day of the event, since the participants did not have permissions for posting comments.
- Participants might have considered that there was a lack of incentives for contributing to the discussion.

### 6.5. Conclusion

It was possible to determine the experience of the participating project managers about almost all the threads discussed and the quality of their posts was very good. We consider that the participation level was quite acceptable and we would like to give this format of event a second trial to collect more qualitative data for the research purposes of the DESIRE project.
7. Second Online Discussion Event for Project Managers

7.1. Introduction

The second project managers' Online Discussion Event took place from 7 to 9 November 2012 and was also moderated by Marisa Hernández, researcher in Science Education at the Centre for Research in Science and Mathematics Education (CRECIM), in the Universitat Autònoma of Barcelona, Spain.

During the three day event project managers were invited to discuss which European and national science education project results they have knowledge of. The issue of impact in educational practice or effectiveness of dissemination methods was also discussed.

7.2. Summary of the content of the discussion

The following sections contain summaries of the discussed themes each of the three days and the outcome of the discussions.

Day 1

The first day had a focus on the STEM education projects about which the participating project managers had had some information or involvement in order to share experiences on dissemination strategies of certain projects. This first day had a moderate level of participation (21 posts) but the contributions of participants were very valuable.

Most of the European projects that the participants mentioned were funded by the 7th Framework Programme of the European Commission. Some examples are Traces, Nanoyou, S-Team, CoReflect and Fibonacci. The participants explained their experiences as coordinators or as target audiences of these projects.

As a project coordinator, one of the participants mentioned that it would be necessary to document experiences well and to present them in a flexible way in order to spread good practice.

“In general, my idea of dissemination is summarized as follows: We can spread good practice if the experiences are well documented and presented in a flexible way in order to generate adaptive processes. The results should be stimuli in their environment to generate new initiatives that take account of previous research. For example, to the recommendations of TRACES we are now involving the Italian schools to understand together how the reflections on experiences can be the engine to generate effective learning activities, new ways of interacting with colleagues and researchers, etc.”

Regarding the issue of flexibility or adaptability of projects’ outcome pointed out by one of the participants, he added the following comment:

“Obviously it is not easy to share a model to encourage the development of new initiatives that relate to the experiences made in the field activities in a previous project. For example, if we refer to the training courses that have already been tested successfully, the key point is how to facilitate the re-appropriation by teachers and other stakeholders. The aim should not be to give recipes but to put people in a position to learn from past experiences”

This participant even provided some good examples of formats that would facilitate the adaptation of project results for the purposes of teacher training, such as:
- “Case studies, which allows framing the experience carried out with attention to the context and boundary conditions. The emphasis should be on the evaluation of both the learning and the process.

- Resources such as learning materials for students, scripts for teachers with a detailed description of how the materials were designed and used, movies of educational activities, audio and video interviews, or analysis of interesting situations in the conduct of activities.”

As part of the target audience, some project managers explained that they got to know some of the aforementioned projects because they had been involved in previous projects addressed to a similar topic or because these projects matched their interests as teacher trainers or teachers.

“I have heard of the project S-Team [...] via the contact with the researchers involved. I have gone to their website in order to consult some of the documents. I have done the same regarding other FP6 projects, such as Mind the Gap and Parcel, also CoReflect... Some of them have been very interesting for me as researcher and teacher trainer”

The most common dissemination channels of these projects that the participants highlighted are online courses, face-to-face presentations, website, and informal contact with colleagues. The project results that were appreciated as the most interesting or useful are: training packages/materials, immediate and usable classroom materials, and resources on scientific content accompanied by some support.

“Nanoyou produced a lot of material, some of which is of great quality (the film, the role playing game), and easy to use”

“Material that is of good quality, user-friendly and easily understandable for the “common person” is the ace up the sleeve in my opinion. I believe training events and training packages together, followed by constant contact with and feedback from, peers and trainers would work best. In my opinion, there is nothing more immediate and usable than having at your fingertips documents to rely on, and similarly interested people guided by good facilitators at an arm (or computer)’s distance. Obviously, many of the others can have their (additional) place”

The participating project managers also pointed out some difficulties that they can foresee regarding certain dissemination plans.

“Difficulties can lay in the organization [of training events], the selection of trainees, the language(s), the recognition of the trainings”

“I have found very innovative the TV documentary [as a dissemination channel], as something that I have not heard before in other projects. However, sometimes this sort of materials is mostly a sort of propaganda with a very poor effect on disseminating project results or ideas”

Finally, one of the project managers raised a key question: what do we mean by dissemination of project results? She distinguished three purposes of dissemination: (1) dissemination of the project itself to make it known by others; (2) dissemination of project outcomes to potential beneficiaries; or (3) creation of a network or infrastructure for large scale dissemination. This participant also raised the question of whether all the projects should develop all these three facets of dissemination:

“Of course, in most projects all three dissemination types are used and sometimes combined (for instance, when disseminating teaching and learning materials also the project is disseminated and depending on how they are distributed, a dissemination infrastructure could be created) but it is important, at least for me, to think about them separately so that you
realize what dissemination strategies you are using for each purpose. In my case, most of the projects in which I have participated were devoted to the second type of dissemination, making the project rather invisible and not concentrating enough effort in thinking of developing an infrastructure to spread results and resources... From my viewpoint, this was not problematic in itself, as some projects must be more focused on creating something to be further disseminated than on dissemination...but it is problematic if these projects are not followed by other projects that exploit further its results.”

Day 2

During the second day of this event, project managers were asked how to evaluate the dissemination plans of a certain project. A number of different qualitative and quantitative indicators to measure the impact of a project’s dissemination plan according to its initial goals and targets were listed and project managers were invited to discuss which ones they find more relevant and more challenging to measure.

One of the participants shared her experience recognizing that “targets set in dissemination/communication plans are mainly quantitative ones: website statistics, involvement of more teachers/schools after the end of the project, papers published and cited”. This participant considered that “other qualitative indicators (e.g. achievement, enthusiasm of participants, changes in individuals’ understanding of the project outcomes, change in subjective views from individuals, positive changes in approaches to teaching) are usually set as overall indicators for the project results beyond the dissemination in itself”.

Regarding this viewpoint, the moderator also discussed the need for evaluating not only how many stakeholders are reached using a certain dissemination strategy (as a quantitative indicator) but also how understandable and usable it is perceived by them (as qualitative ones).

Another participant considers that “involvement of more teachers/schools after the project has ended would be the most relevant indicator whereas participants’ enthusiasm would be the most challenging to measure”.

Day 3

The third day discussion was focused on the needs of each target audience concerning dissemination. Project managers were invited to exchange ideas about how to make project results not only available but also more understandable and usable to help each target audience apply these results in practice efficiently.

Only one participant was involved in this thread and expressed his position that teachers’ needs (for instance) should be taken into account before starting a project since any funded project is addressed to specific stakeholders’ needs or problems.

“I’d say that teachers’ needs and dissemination activities are two separate things. Needs’ finding should be at the very beginning of the project cycle, dissemination at the end. If your project doesn’t address teachers’ needs then you can have the most brilliant dissemination plan that reaches every single teacher in Europe, but teachers simply won’t use your project results.”

The moderator briefly discussed this contribution considering that although projects’ outcomes addressed teachers’ needs, the dissemination plan could not take into account aspects such as teachers’ favourite channels or characteristics (language, format, length, duration, cost, etc.) that would facilitate their engagement and understanding. According to this viewpoint, there would be some specific needs to take into account when talking about dissemination strategies.
7.3. Feedback on the second Online Discussion Event for Project Managers

Problems encountered:
- 12 and 4pm, moments when the moderator posted further questions, were not actually moments with higher number of participants discussing them. However, participants posted comments at different times.

Positive aspects observed:
- Exchange of good practices and deep reflections on the part of the participants. Some participants or viewers let me know that this exchange of ideas and experiences had been an interesting event to them and a topic that is worthy of discussion.
- Summaries of the dissemination strategy of a certain funded project have been appreciated by some participants as interesting information.

Improvements required:
- Platform: the process of registration and signing in the platform has turned out to be quite challenging for new participants. However, it is difficult to evaluate how much influence this issue has on project managers’ decision of participating to the event.
- Participants’ involvement: For this 2nd ODE for Project Managers, fewer subcategories and threads per day were proposed to attract all the attention towards fewer topics each day. Asking many questions on the part of the moderator was also avoided but some information about dissemination strategies of funded projects was provided. This had a positive reaction on some participants but it was not enough to increase participation. As a consortium, we should think carefully of how to involve participants so that they are interested in the topic under discussion.

7.4. Participation

Here are some statistics on the second Online Discussion Event for project managers:

Number of invitations made (if possible, please specify typology of invitees):
Total: 42
Target type A: 21 Project managers involved in science education
Target type B: 21 Academic field researchers on science education

Number of actual participants (if possible, please specify typology of invitees):
Total: 6
Target type A: 4
Target type B: 2

Average number of posts per day: 11
- Number of posts in Day 1: 21 (4 participants + moderator)
- Number of posts in Day 2: 7 (2 participants + moderator)
- Number of posts in Day 3: 5 (1 participants + moderator)

Ratio posts/participant per day: 1/8

Silent views per day: About 100 on the first day, less than 20 on the following days

Along the three days event, there were 33 posts. The distribution of the posts per day is shown in the next figure:
As shown, the first day had the highest number of posts and this number decreased day by day. The statistics from this second project managers ODE show that the event had a low participation level from which we can drag some useful ideas and experiences of the participants that can contribute to the identification of better dissemination practices in future STEM projects.

As shown in the next figure, there were also several views of each category (Day 1, Day 2, and Day 3):

The low amount of participation compared to the involvement during the first Online Discussion Event for Project Managers might be interpreted as the result of:

- Time constraints, as some invited project managers apologized for not attending the event due to busy agendas on those dates.
- Technical difficulties that arose during the 1st day of the event, since the participants had some problems to register and sign in the Desire portal.

7.5. Conclusion

It was possible to determine the experience of the participating project managers about some of the threads discussed and the quality of their posts was very good. We consider that the participation level was quite low and thus, we would like to rethink the format of this event to adapt it to the participants’ needs or interests and to the purposes of the Desire project.
8. First Online Discussion Event for Science Events Professionals

8.1. Summary of the content of the discussion

A LinkedIn Online Discussion Event was organised by Danish Science Communication (DNF) on the 15-17 October 2012.

The event was moderated by Mikkel Bohm, the director of the Danish Science Communication, a Danish NGO that targets children and young people to create excitement about science and technology. The few professionals who participated in the ODE to a large extend agreed that they found information about EU-projects interesting - but that they also found it very hard to find the time in a busy daily life to read and absorb often very complicated messages from EU-projects.

Everybody agreed that the most efficient way of spreading knowledge about EU-projects is through personal meetings and face-to-face discussions. Everybody recommended that emphasis should be laid on using conferences, meeting places, symposiums etc. to exchange and debate findings from EU-project. They strongly recommended that such platforms should be implemented in dissemination strategies of future EU-projects.

8.2. Feedback on the first Online Discussion Event for Science Events Professionals

Problems encountered: People were more likely to view the discussion than to participate.

Positive aspects observed: The posts of the participants where well reflected and is useful data for the further analytical process of the data.

Improvement required: This might not be the right format for carrying out an online discussion for science event professionals. DNF will use Google Hangout for their next event. They will send out individual invitations and call persons from the target group to make sure they have the time and focus to be interviewed when the event takes place. It might result in several interviews with individual persons.

8.3. Participation

Here are some statistics on the first Online Discussion Event for Science Events Professionals:

Total: 17 personal invitations + group invitations + invitation at presentation at EAC12.

Target type: Science event organisers from all over Europe.

Number of participants: 3

Number of posts: 5

Silent views: 20
9. First Online Discussion Event for science museums and communicators

9.1. Introduction

The first science museums and communicators Online Discussion Event took place from 23 to 25 July 2012 and was moderated Elisabetta Tola, founder of the science communication agency formicablu in Rome and Bologna (Italy).

During the three days event, science museums staff in charge of education or teacher training, and science communicators at large were invited to discuss how they are informed about European and national science education project results. The following sections contain summaries of the discussed themes each of the three days and the outcome of the discussions.

9.2. Summary of the content of the discussion

Day 1

The first day aimed to define the habits of the participants in gathering data. The first mentioned source was the web, especially to gather pictures and videos, but also some science education news. “To get information, I often refer to “Scientific American” for science news, and gather science education resources at http://www.schoolscience.co.uk/.”

The main quality of the web was that it enabled to get information from a wide variety of sources. “The web is also my main source. I browse for instance New Scientist, Wired (.it and .com), educazioneduepuntozero, bbc/news/science (and tech and health) pages, Google news (searching for science and technology) in US and UK.”

Science blogs were often used, on a regular but not intense basis. Several platforms (scienceblogs.com, www.cafe-sciences.org...) were mentioned. These blogs were used to keep up-to-date. However, when designing a specific activity, experienced manager advised that online source were not sufficient: “With my young collaborators I often have to struggle to convince them to stop sometimes searching the web and make a couple of phone calls and go and talk to people!”.

Indeed, many of the participants immediately mentioned that direct contact with people involved in research or project was crucial: “the web is an obvious place to keep up to date, see what’s happening, but - in particular if you are developing things which have a longer temporality than the news, nothing can replace the direct contact with researchers. Spending time talking is still the best access to information for me.” The participants all agreed that the most important source was the researchers themselves: they mainly relied on direct contact with scientists to get complete and reliable information, as well as for understanding how a topic is tackled.

Social media were mentioned – Facebook in particular – but the live human network seemed even more appreciated than the internet social network. Conferences on science communication and education were seen as a very good access to new projects and practise. “I don’t go to proper scientific conference. No time. Moreover they are too specific for me. On the other hands it is a good opportunity to attend to conferences as ECSITE or PCST or HANDS-ON International.”

Newsletter and bulletins were appreciated; most of them were national or local ones.

These different channels were seen as complementary, as they were not providing the same kind of information.

The fact that science education was often restricted to the public sector was mentioned: “I never experienced any difficulty while editing popular science; instead this seems the case with educational publishing and research in science education. Just a while ago I was told by a friend of mine – an educational researcher himself and a precious source! – that, as an employee of a publishing
company, I probably wouldn’t be welcome into his environment. I guess this is due to some kind of uneasiness in sharing ideas and projects between a public institute and a private enterprise (but are our goals so incompatible, after all? I don’t think so).” One may assume that having science education disseminated through public and private channels may enhance its impact.

Day 2

On the second day, the discussions focused on European projects results.

Participants usually obtain information through newsletters and national press releases. Journals for science education are used, but most of the articles concern formal science education – in the classroom: “Therefore we mainly check relevant journals for science education (e.g. the journal for didactics in science of the University of Kiel http://www.ipn.uni-kiel.de/zfdn/) or the database of the Austrian IMST-Project. Unfortunately most of the articles focus only on science teaching in a classroom context, there is very little evidence about non-formal science teaching.”

Once again, conferences and events were seen as the main point to hear about the latest European projects. “If I come across EU projects relevant for my work I do check the different work packages and try to find out their respective leaders. But I think that it’s usually at conferences that I hear about EU projects that I am interested in, so the main channels for me are conferences...” “At the last ECSITE conference I heard about the research2practice project (http://www.research2practice.info/) which I really consider as a great idea: on this page you find abstracts and short overviews about actual research concerning non-formal science teaching. I think this form of dissemination of very specific research concerning exactly our field of interest is a practical way to be up-to-date within an acceptable amount of time.”

There was a need for informal science education results that led to the idea of having a common European database were all ongoing and finished science education projects would have to deliver their results. “Maybe it could become part of the dissemination routine of EU projects to post an abstract and a short version on a common database (instead of producing lots of useless brochures that nobody will read)...So at least all people involved in projects know about this data base. Another idea could be to link the database to homepages of national, regional and topic-related networks.”

This searchable database would include material for specific groups of interest (teachers, informal learning, event organizers...), and results from more research-action experiences which do not usually get published in academic journals. Participants raised an issue on how to deal with the technical jargon, and even the English language was seen as a barrier in some countries.

“So I think setting the data base could be a priority with respect to a “translation” for a broader audience. Provided that the projects and outcomes are published in English too... Otherwise a translation would be very handy.”

Day 3

The third day specifically aimed to determine the key information that should be communicated to catch science communicators’ attention.

First of all, the participants defined their strategy to select relevant information. Once again, the live human network appeared as crucial: information relayed by colleagues met during specific events was seen as extremely valuable. More than on communication tools (graphics, pitch...), professionals claimed to rely on their peers to outline the relevant projects. In database or newsletters, categories (educational fields...) or the type of educational setting it refers to (formal, informal...) were the first selecting tools.

“The key categories I prefer when searching in data bases or deciding to open documents are: 1.) to which educational setting does the research refer (e.g. non-formal learning, primary school...) 2.) the field of science education (e.g. conceptual knowledge, cognitive competences, epistemological competences, procedural competences)
3.) the methodology and philosophy of teaching (e.g. constructivist didactics, IBSE)  
4.) the methodology of research (e.g. case study, action research, qualitative or quantitative study)  
5.) who is the author, which institutions are involved”

Several tools were again mentioned. Some of them closed due to a lack of funding (Institute), others were about to start (etLife).

The Day 2 discussion went on during day 3, and it appeared to all that involving the future results users (teachers, communicators...) in the project since the beginning may imply a relevant dissemination, right from the start. The users may even be co-authoring some works to ensure the materials are accessible. However, this approach could be challenging:

“1. early inclusions of 'users' in the project and not only final destination - this though raises few other problems: involvement means also sharing funding (I do not know in other countries, but in Italy for instance teachers are quite badly paid and are not always willing on taking a lot more commitment to other things without an economic incentive) - in a EU project I have been involved into, scientists preferred in the end to keep the money for their research rather than using it for real and effective stakeholders involvement which resulted, as a consequence, in a very weak one.

2. Co-production of material is a great idea, but it requires a lot of effort on all sides: finding a common language, recognizing each other skills and competence, and so on. Does anyone, besides the ones who have already told us about, have good examples of this? Which tools might further help and enhance this cooperative ability and attitude?”

It was even suggested that the outcomes of European projects could be disseminated to students in schools. “Thus, the research projects deliverables could feed in the school and pupils projects. Even if the results are not exploitable yet, the problematic linked to the preliminary knowledge, the method and the chosen protocols is already very interesting and should be accessible in a simple and usual language to the pupils”.

Good options may also be to organize early project meetings with future users, or to include users in an advisory board.

“One thing we did in an EU project I am part of was to have a stakeholder meeting in the middle of the project. We presented our initial ideas and topics to a selected audience that we knew had interest in the final outcomes of the project. So we presented them our various ideas BEFORE actually going out and doing empirical work. That gave us the opportunity to get their views on several things: that our frames are useful to them, that we didn't miss something out, to already disseminate some ideas, to establish contacts... We will have another such meeting towards the end of the project.

So I think a crucial thing is to build in several mechanisms for allowing ”user feedback”, or whatever you might call it.

Another method I have come across is to have a sort of advisory board or panel of "consultants" for the project, including not only academics but all kinds of people. Getting their view on intermediary reports and ideas is also useful…”

9.3. Feedback on the first Online Discussion Event for Science Museums and Communicators

Problems encountered:

- The forum platform required a little involvement.
- The language was a barrier for some of the participants.
- The forum form was not so adapted to the practice of the participants; many connected during the evenings.
Positive aspects observed:
- Excellent help from EUN with the platform
- Fruitful discussion raising interesting and unexpected ideas
- Success of the 12pm and 4pm “live” moments.

Improvements required:
- no time-out disconnections on the platform
- Find a way to increase the participants involvement
- Increase the number of participants.

9.4. Participation

Here are some statistics on the first Online Discussion Event for Science Museums and Communicators:

Number of invitations made:
Total: 30
Target type A: 24 Science museum managers involved in science education
Target type B: 4 academic field researchers on science education
Target type C: 2 science communicators’ editors

Number of actual participants:
Total: 12
Target type A: 9
Target type B: 2
Target type C: 1

Average number of posts per day: 31
  Number of posts in Day 1: 40
  Number of posts in Day 2: 38
  Number of posts in Day 3: 21

Ratio posts/participant per day: 2.6
Silent viewers per day: 1133

Along the three days event, we had 99 posts and about 3398 views. The high amount of views might be interpreted as the result of a successful dissemination of the event. The distribution of the posts and views per day is shown on the next figure:
The first and second days had a higher number of posts, as shown in the next figure:

![Number of Posts](image)

*Figure 21: First Online Discussion Event for Science Museums and communicators - Number of posts per day*

The day with more views was the second day:

![Number of Views](image)

*Figure 22: First Online Discussion Event for Science Museums and communicators - Number of views per day*
9.5. Conclusion

Participants agreed that several useful ideas came up during the three days. They also shared many references such as blogs, websites, databases or other sources of information. However, having the event run for three days was difficult for some of them, due to their work constraints. It was suggested that a live event in a teleconference or webinar format could help the ones who were not comfortable with written English, and would make the event livelier. Moreover, it would be much easier for Science Museums managers to devote themselves completely to an event for one hour than to connect from time to time during three days. Thus, though the quality of the exchanges was acceptable, Ecsite will try changing the format, in accordance with the DESIRE consortium, for the next ODE.

10. Second Online Discussion Event for science museums and communicators

10.1. Introduction

The second Online Discussion Event took place from 20 to 23 November 2012 and was moderated by Elisabetta Tola, co-founder of the science communication agency formicablu, in Bologna and Roma.

This online event consisted of two teleconference meetings through the Google Hangout platform. Each teleconference lasted one hour, and involved four participants, one moderator and one DESIRE project manager. The participants were science museums education managers – responsible for teacher training – and science communication publishers or developers.

During the teleconferences, the participants were invited to discuss how they use project results and if they use both resources and methodology information from project results. The following sections contain summaries of the discussed themes each of the three days and the outcome of the discussions.

10.2. First Teleconference

The first teleconference was held on November 22nd 2012 at 10:00 am CET. The participants were:

- Andrea Frantz, NaturErlebnisPark, Austria
- Silvia Grabner, NaturErlebnisPark, Austria
- Danel Solabarrieta, Elhuyar Foundation, Spain
- Federica Manzoli, social scientist and expert in science education/training projects, Italy

All participants made use of the results of recent studies and projects researching STEM education to develop their own projects, but at a different degree depending on the country and on the project.

In the Austrian case, a strong effort has been put by the government to promote STEM research and education. This has been completed with tools, like a national database and the promotion of teacher and science educator networks, which function quite well both to connect people and to redirect them to appropriate sources and references.

In the case of the Basque country, Elhuyar foundation works in collaboration with the local University and selects, depending on the project they are working on, appropriate experts as consultants.
In Italy, teacher networks are strongly focused on practice, experience and very little on research outcomes in the field of pedagogical research. There is a strong distance between the academic environment and the practical world of teachers and trainers. Only occasionally, researchers from the academic environment end up working in close collaboration with teachers and people directly involved in the formal and informal science teaching. There are very diverse situations and, given the dimension of the country and the fact that there are strong differences between regions, it’s very hard to describe a common trend. However, there are specific projects where people who are involved directly in formal/informal educational projects might look for research outcomes in the science education field, in particular in the area of action research.

All participants seem to experience that there is not a straightforward method to reach results obtained at the EU level. In fact, most of the sources used in their routine work come from local/national connections: local universities, national teacher networks, specific programmes and/or projects.

When directly questioned whether they could suggest one European project and/or tool that is well known and used as a source for their activities, they could not mention anyone. Most of them will get to EU projects websites only after having met and talked with someone who is directly active in such a project (some mentioned the participation at the Ecsite annual conference as an occasion to get much information and hints about potential sources and materials).

General impression of the participants is that anytime you are looking for some specific information (i.e. a research outcome, a report, a guideline or some other practical tool to acquire information on the latest results on science education) it’s scattered in many different places. When on the web, it’s scattered amongst many different websites. There is not one specific place to start their research from.

One strong suggestion coming out of the meeting is the idea of building one single EU database, organized in such a way to enable teachers, communicators, trainers to find through keywords and tags straight links to projects, reports and published references resulting from all EU projects related to a certain topic. Specifically, such a unique database would be a perfect starting point for practitioners seeking resources which come from different projects focused on similar topics.

It has been highlighted that the field of research into STEM education is quite recent and that most countries will not have enough knowledge, or critical mass to get good and sound results within the national boundaries. Such a database would be of enormous value to compare outcomes of strategies and approaches both to formal and informal science education experimented in different countries, situations and within diverse learning environment. One participant pointed out that for example it might be easier to compare rural situations across Europe and urban ones rather than urban/rural within the same country.

Some practical suggestions about the database that could serve as a useful starting point to access EU projects in the area of research in STEM education:

1. It should be a very simple and immediate structure, accessible for the average teacher and practitioner who might not be highly digitally savvy.
2. It should contain very simple description of the projects and work more as a link to the projects website, products, reports, references, published work, and so on.
3. It should always have a brief summary in English even when the materials are published in other languages. At least, at the very first level, people can decide whether to explore a certain project website, using translation tools, if the description is of interest.
4. It has been pointed out that the language barrier might be a strong obstacle. One possible solution it might be that of asking local partners within EU projects from the different
countries to act as local hubs, putting materials and project results in context and help local teachers/practitioners to access the materials.

5. Tools and materials, other than written reports, guidelines and papers, should be uploaded and/or produced within a few standards of reference: one of the major problems in re-using other projects outcomes is often on the technical side (variety of formats, standards, etc.).

6. An effort has to be put to advertise and promote the database (and to organize tutorials to make it accessible) through the teachers/trainers/practitioners networks at the national level. There is no point if the database remains hidden in some website and is left unused.

7. To make sure the database is kept up to date, each project coordinator should fill a standard form (as he/she already does for the reporting) which will be directly feeding the database. In this way, there is no need of any intermediate step to update and keep the database alive.

10.3. Second Teleconference

The second teleconference was held on November 24th 2012 at 10:00 am CET. The participants were:

- Anna Gunnarsson, Navet Science Center, Sweden
- Stephen Roberts, National History Museum, London, UK
- Guillermo Orduña, Esciencia, ES
- Martha Fabbri, Mondadori Education, IT

10.4. Conclusion

This teleconference format was very successful. The experience was much more enjoyable and easier to engage with. Thus, the quality of the discussions was enhanced, and participants found out they really met each other, building a beginning of a stakeholder community.

11. First Online Discussion Event for Policy Makers

11.1. Introduction

This report is a summary of the first Online Discussion Event for policy makers, which took place from 15 to 17 October 2012.

The participants were invited by the moderator especially for the considerable experience in European projects management and in interacting with policy makers. In particular, all participants agree on the need to understand how to make effective and usable results from innovation projects in STEM. All are interested in understanding how to overcome the distance that exists between research and practice, including proposals for innovation and practice.

During the three days event the participant discussed the results of several European and national science education projects and the related dissemination strategies. In particular, participants were asked to refer to both their direct experience and what emerges from reports and results of research on the processes of innovation, with the aim to exchange views on how to have a real impact on teaching mathematics, science and technology in school.

Due to the nature of the topics covered in the three days of discussion there has been continuous overlapping among the sub-topics. So in this report, indications emerged not faithfully according to the timeframe of interventions but are rearranged into three content areas. The event was also attended by two people from Latin America on behalf of groups of projects closely related to the issues under discussion.
11.2. Summary of the content of the discussion

The following sections contain summaries of the discussed themes from each of the three days and the outcome of the discussions.

Adoption of innovation and STEM Projects Impact

On the first day the discussion was stimulated by an assertion:

“Resources and best practices that emerge from science education projects have a poor diffusion in classroom practice. Many reports on STEM teaching show that even if teachers positively evaluate innovative proposals, they are reluctant to adopt change if the proposed innovation does not resonate with their conceptions, beliefs and professional experience.”

About the difficulty of adopting innovative proposals, from the discussion highlighted the need to discuss about the nature of academic research and the necessity to involve teachers in research activities and not as a target group.

“In my opinion, resources and best practices that emerge from science education projects have a poor diffusion in classroom practice, because teachers are not really involved in these projects as actors. Usually the academic researchers do not consider teachers conceptions, professional experience and real needs to delineate the innovative proposals. The delineation of innovative projects in science education should emerge from the school community, anchored in their issues. This means that the academic community, including students, should be closer to the school since the beginning of teacher training programs.”

“I would like to discuss about the actual feasibility of making teachers' job a research activity. This should involve a re-thinking of several structural aspects in school organisation, but above all a change in the current cultural background, which research in (science and maths) education is carried out. Especially, what role should different stakeholders play and what contribution are they able to do, with regards to that possible change of perspective?”

Strategies for effective dissemination of project outcomes

The debate has been prompted by a statement on the involvement of teachers in educational innovation projects.

“Several researches and experimentations show that teachers should be involved in the design and evaluation of the proposed innovation. It is not enough the initial training on the proposal. Required changes must be supported by an ongoing relationship with researchers and experts, who have, among other things, involve teachers to promote the exchange of experiences in school”

In the discussion has been shared the need for an educational research that involves teachers in an active way also for the dissemination of good practices. Then they dealt with issues that concern the government of the school, the role of the community and the interaction with the relationships with the policy makers.

“We need to work on both directions: with a 'contamination' strategy involving more group and more teachers, and with a systemic strategy fighting for change some of the conditions of teachers work (more time for study and research, for following training courses, for participating to projects...) and for achieve more visibility and recognition for innovation in science education.”

“I propose two things 1. The governments have to provide motives to teachers to be involved to. And if there is no money, they have to give academic and vocational motives. 2. We need one period of time to develop out projects and the same period to disseminate it among teachers. Also, we need to educate/ train mentors and they will disseminate the results in their turn.”

“Whilst the focus is always put on the teachers, the Head of the school institute has a very important function in supporting or hindering the innovation. I think that the selection of these professional
figures should be done with great attention to their crucial role in promoting change and they should be always directly involved also by researchers when promoting research-action projects. The responsibilities of the Head do not end in just giving their agreement to innovative projects, or to educational programs offered by external agencies: they consist in an active participation with pedagogical competences, in managing the organizational aspects, in making the teachers a community which shares objectives and policies.”

“So ... my proposal is to:
- organize cluster of discussing teachers (in presence and at distance)
- reflect on the discussions e help for some meta-conclusions (a coach can help in this sense)
- compare pre-discussion ideas with those after discussion and look at the impact.

Cooperative discussions oriented to reach a common idea are the way in which people grow in professional development, producing modification in the perception of the problems and in the way of thinking”

“I have not definite suggestions but in these years I matured the belief that while we have strategies - slow but effective - to involve teachers in STEM research, we have very few strategies to 'mainstream' what we have found and to convince the policy makers that changes are not only possible but absolutely necessary”

“Many projects - especially in Latin America - showed how involving the communities could be useful for supporting STEM implementation and innovation.”

Effectiveness of dissemination activities. Examples and Models

The discussion on the last topic was stimulated by summarizing some of the issues raised above and suggesting some questions about successful examples and possible models of dissemination.

“... despite the different experiences from which we come, we are all aware of the complexity of the topics ... almost all share the fact that innovation must take into account how people learn, the actual teaching conditions, the needs of teachers, the socio-cultural aspects, etc. ... schools are regarded as complex systems of interacting dynamics. In the dissemination process, teachers are not the target of an intervention based on assumed evidence but the protagonists of a participative process in which they work together with researchers, experts, policy makers as peers at all stages of the process. Discussion about curricula, teaching methodologies, assessment and more generally about priorities in STEM should be part of an open debate on issues that are related to cultural specificities of local communities. A possible strategy could be the construction at both the local and central level of consulting commissions involving teachers, researchers, students’ families, school principals and administrators, and all the other relevant actors. What are, in your experience, examples and transferable models of educational innovation that you think are effective?

The interventions focused on different topics and in particular on the conditions for implementing the innovation and some experiences in Traces project.

“Experience shows that it is important, in addressing to teachers, to avoid mistakes already made several times with pupils: in order that significant changes can be obtained, it is important that the "asymptotic" goals of the proposed changes are modulated in structure and time according to the actual (teaching) conditions one strives to change. What has to be changed, in fact, are mostly quite profound "ways to look at" different components of the teaching habit: cultural structures, pupils’ cognitive dynamics, cooperation with colleagues, roles possibly played by technologies, classroom handling and gestures, and so on. In order such aspects coherently produce an effective impact on pupils, they must be gradually (re)appropriated by teachers as driven to reciprocal resonance: in practice, this means a gradual (guided) drift from the actually practiced teaching modes to new, more satisfying ones.”
“As demonstrated by the TRACES project, and many others, if the researchers really listen to teachers’ needs and possibilities, it is relatively easy to fill the gap between research and school practice. This require big efforts, collaborative strategies, follow up, but it works. The point is that it does not change the system, and not transform the local and national 'culture' about science education”

“We need to support and to involve teachers, but we need also to ask for the recognition of educational research, and for orienting educational research to educational practice. In many countries, and Italy is one, educational research is not really valued, not at school as a teacher quality, not at the universities. A European position on this point could be an important policy move: research is an intrinsic component of education. If education want to be effective while contexts and students competencies change, continuous innovation and teachers’ lifelong learning are needed, and this is not possible without research”

“I have participated in TRACES Project and the focus of my research work is Physics Teacher training (initial, in service and continuous). In our research group we strongly believe in the effectiveness of teachers’ involvement in innovative projects and researches if we want to really change real teachers practice at schools. We think that the research projects and innovative proposals need to be planned in a way based in real teachers' needs, doubts and interests. In our Case Studies teachers’ involvement was really interesting. It is true that we need to reach a bigger audience if we really want to change Science Education in our countries. And this involvement is connected with better working context, social recognition and a better salary on one hand and better schools, with internet access, good libraries, buildings and so on. This should be policy-makers duties.”

11.3. Participation

Here are some statistics on the first Online Discussion Event for Policy-Makers:

ODE title: Discussion event for policy makers
Target: Policy makers
Date: 15-17 October 2012

QUANTITATIVE ASPECTS

Number of invitations made:
Total: 21 + members of the EUN Steering Committee. Invitees are policy makers, researchers or professionals, participating in national Ministry of Education boards or commissions.
Target type A: NC
Target type B: NC
Target type C: NC

Number of actual participants per day:
Total: day 1: 2; day 2: 8; day 3: 6
Target type A: NC
Target type B: NC
Target type C: NC

Number of posts per day: day 1: 4; day 2: 14; day 3: 8

Ratio participants/post per day: on the average, 2 per participant.

Silent viewers per day: all participants posted at least 1 message
Along the three days event, there were 26 posts. The percentage of the posts per theme is shown in the next figure.

![Thread Posts](image)

**Figure 23: First Online Discussion Event for Policy Makers - Number of threads posts per topic**

In contrast, the total number of views of posts was high (857 views). The high number of views and the distance between the numbers of views and posts confirms both the interest and the complexity of the subjects discussed. The percentage of the views is shown in the next figure.

![Thread Views](image)

**Figure 24: First Online Discussion Event for Policy Makers - Number of threads views per topic**

The event has not involved a large number of participants. However, interventions were all very articulate and expressed views consistent with what emerges from major U.S. and European reports on the "state of the art" on STEM teaching.

### 11.4. Feedback on the first Online Discussion Event for Policy Makers

**Problems encountered:**

**Technical problems:**
- in the registration form. Somebody complained that the registration form (particularly the creation of the Open ID) was quite complicated and somehow rigid so that some profiles were not encompassed.
- in the time displayed associated with posts and threads. The time was set ahead of two hours so this was a bit confusing.
- permission connected with the moderator. The moderator was allowed to create categories only Monday morning, after 9 am.

Organisational problems:
- INDIRE, EUN and the moderator had identified several people but just few showed up. This may be due to the fact that policy makers are very busy people so that they cannot guarantee a 3-day attendance as preannounced in the invitation and programme.

- The format is time consuming because one’s obliged to come back many times to check if others replied or to read through very long text comments.

Positive aspects observed:
Despite the problems encountered, some feedback is useful to our mission. Participants posted very long and useful answers sharing their knowledge and experience. Participants were coming from all over the world.

Improvements required:
We are thinking of organising a shorter synchronous session on our platform and to invite a smaller group of policy makers to which we can administer specific questions and get their answers in a “tour-de-table” mode.
In order to guarantee the conservation of the data, we can record the event and access it later on.

11.5. Conclusion

The impact on the STEM teaching of European projects is very poor. On the one hand we need to understand that innovation proposals are accepted only if they resonate with the practice and ideas of teachers; on the other hand, it is necessary to involve the whole school, regarded as complex system of interacting dynamics and not isolated teachers, in local and national dissemination plans.

Plans should be aimed at knowledge, selecting, and sharing of best practices that are well suited to the context. Schools must be open places of permanent experimentation and teachers should be involved in the design and evaluation of the proposed innovation. It is not enough an initial training, in order to allow the adoption of innovative proposals. Required changes must be supported by an ongoing relationship with researchers and experts who have, among other things, to involve teachers to promote the exchange of experiences in school.

External stimuli are needed but teachers must build themselves, working with other teachers and researchers, proposals for educational innovation: without experimentation and research it is impossible to adopt any proposed change. If it is true that sometimes policy makers are more sensitive to the organizational aspects, the experience shows that it is necessary to involve policy makers, not only in the plans for dissemination, but in the various phases of a project with the aim to have feedback and to evaluate the potential impact of the project on educational policy.