

The logo for NANOPINION features the word "NAN" in orange, a stylized grey and white circular graphic with a central orange dot, and the word "PINION" in black. The letter "O" in "PINION" is orange. The entire logo is set against a light blue rectangular background.

Monitoring public opinion on Nanotechnology in Europe

*European Platform on Nano Outreach and Dialogue (NODE)  
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## **D1.2 – Best practice report**

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## Executive Summary

In Deliverable 1.2 – Best practice report – the results of identifying good practice examples of nanotechnology outreach and nanotechnology communication strategies are presented. The focus was set on innovative activities that are beyond traditional science communication and are addressing different target audiences. For identifying good practice examples different data sources were used, but also the snow ball effect brought results. As results of the data search activities were screened, selected according to defined criteria (not only on European level, but also national projects were considered) and analysed.

The deliverable at hand contains an introduction on the aims and scope followed by a chapter on the rationale and methodology, discussing the theoretical background and the practical approach to identify good practice examples. Chapter three describes the material and the methods for screening, selection and analysis of the good practice activities. In chapter four the detailed results are presented. Characteristics of the assessed activities, making them innovative are described as well as target groups addressed and different formats used. Afterwards selected good practice activities are presented in detail, followed by an overview of possible adoptions for improvement. Chapter five consists of a synopsis for outreach of (nanotechnology) science communication, derived from the results and findings of chapter four. The most important issues can be summarised in three main points:

- **Target group:** Target group orientation, early integration, involvement in creation, detailed knowledge of target group
- **Elements and formats:** Use of already existing infrastructures, combination of different formats and perspectives, outreach in public space and local events, creation of spaces of opportunity, attractive and engaging formats, self-experience
- **Content:** risk and benefit discussion, connection to real life



# 1. Introduction - Aims and Scope of this deliverable

This document describes our approach regarding the identification and evaluation of good practice examples of nanotechnology outreach and nanotechnology communication strategies on different target audiences. It documents the methodological process and presents the findings from the analysis of different materials collected. The aim of this document is to identify and assess good practice examples to be replicated and further developed for the NanOpinion project. The task that is captured in this deliverable is not based on scientific data and statistics but is aimed to **draw up a profile of innovative and successful outreach activities**. This means that in combination with Deliverable 1.1 a comprehensive view on knowledge, tools and materials produced by nanotechnology projects as well as good practice examples of nanotechnology outreach and communication strategies is achieved. Nevertheless, the work has been designed to follow clear structures and criteria in order to allow comparability and analysis.

Focus will be on activities beyond traditional science communication activities, involving stakeholder groups that are hard to reach. In NanOpinion hard to reach groups are defined as those who are not likely to visit a science museum or to take part in special events or are not interested in nanotechnologies at all. They include, for example, migrants and elder citizens.

The document is structured as follows: first of all, the theoretical background on innovative vs. traditional communication strategies for science communication of this project are discussed in detail in Section 2. This section is also presenting the involved stakeholder groups that NanOpinion is aiming to reach with different outreach activities.

In Section 3 we describe the material, which was used and the methods for screening including desk research on peer reviewed scientific papers published on that topic and media and internet observation, and analysis including stakeholder interviews, and site visits of identified events happening.

Section 4 in detail presents the outcome of the screening and analysis, while section 5 summarizes the results and findings within a synopsis for outreach of (nanotechnology) science communication to give important input for the further development of the NanOpinion outreach activities.



## 2. Rational and Methodology

The pathway of this document begins with a theoretical analysis that defines good practice activities in science communication, envisages a stage involving the collection and information and the analysis of data and finally draws up a synthesis of the gathered theory and material. The pathway involves five logical steps: definition of good practice in the communication of (nanotechnology) science, planning of the methodology, collection of relevant data, analysis and interpretation of the information, formulation of the conclusions and synopsis.

The first step is to define the term 'good science communication'. A second step concerns the planning of the research and the different materials that are examined such as the screening of projects but also visits of life events. Formulation of the activities into main categories is another task within this step. Out of this definition we derive criteria for the evaluation of the collected material. The third step is to collect all relevant information (e.g. project lists, whitepapers, case studies, interviews, site visits, screening of conference papers) and to categorize them in a relevant way according to the type of communication activity. A fourth step, which is also the most challenging and time consuming, is to evaluate and to analyse them. As a fifth and last step, we formulate the results according to the analysed data.

In the following section we describe the screening of the different material collected and evaluated. The different evaluation activities are identified in a multi-stage concept, that includes the screening of nanotechnology projects (section 3.3), the screening of science communication good practice examples (section 3.4), the evaluation of live events and site visits (section 3.5) as well as articles and papers (section 3.6) and Interviews (section 3.7).

### 2.1. Determination of character of good practice activity

As described in the NanOpinion DoW, the aim of this deliverable is to document the *"...identification and evaluation of best practice examples of nanotechnology outreach and nanotechnology communication strategies on different target audiences, considering innovative methods and approaches."* (DoW, p. 39). Thus at the beginning of this task, the question has to be addressed: What is best practice in NT outreach? and What is considered as innovative method and approach?

Best practice is described as *"...a working method, or set of working methods, which is officially accepted as being the best to use in a particular business or industry, usually described formally and in detail."* (Cambridge Dictionaries). According to the European Commission – Directorate General for Education and Culture glossary a best/good practice *"... is an exemplary project (including results or processes) which has positively influenced systems and practices throughout its activities and results. Consequently, good practices are worth transferring and exploiting in different contexts and environments by new users or entities"*. Consequently, this task embeds the requirement to identify projects and activities that have reached excellent results in outreach activities and that are benchmarking. Especially in the area of dissemination and outreach activities, it is impossible to benchmark by some projects due to different figures that are presented for proving success in dissemination. In addition *"... many times, unfortunately, grantees do not conduct dissemination evaluation activities, feeling they are too costly or take too*





*much staff time*“ (Westbrook, 1997). Although the importance of evaluation is well known, it is heavily neglected *“Despite its importance, research dissemination is often poorly resourced and not evaluated”* (Lewando-Hundt & Zaroo, 2004, p. 163).

The effectiveness and efficiency of dissemination and outreach activities are extremely difficult to obtain for projects: i.e. even if one has an enormous amount of people informed by a flyer – does one still have reached its aim of making people aware of certain issues? Especially facts and figures in dissemination provided by EU projects hardly reveal effectiveness or efficiency of activities, since it would be connected with high costs to gather them. Although there are guides for dissemination, the European Commission – Directorate General for Education and Culture confirms this difficult issue on measuring dissemination effectiveness and explains by: *“In addition, dissemination and, in particular, exploitation requires time and that can mean that the evaluation would need to be conducted beyond the actual contractual period of the project.”* Since there is no standard set in the measuring of dissemination effectiveness of EU projects, the data that are collected within this task cannot be seen as complete. It is impossible to extract reliable data sets that would allow any benchmark. Thus the task has reshaped its aims to shape a profile of good practices that are in the area of (Nanotechnology) science communication.

Hence, our results that are presented in the following sections are based on information we gathered from different sources that aimed to collect good practice examples, lists of EU Projects, papers and recommendations but with no official benchmarking or guidelines for benchmarking. Also, these results are seen from a post perspective thus all (with some exceptions) our assessment is based on the information that could be collected after dissemination activities.

The second key element in the identification of good practices is the term ‘innovative’. It implies *“... something new or different introduced”* (<http://dictionary.reference.com/>). Wikipedia even goes beyond this definition expounding *“... innovation differs from improvement in that innovation refers to the notion of doing something different (Lat. innovare: ‘to change’) rather than doing the same thing better.”* (Wikipedia).

Clearly, the way science is communicated (and also Nanotechnology) is slowly changing within the last years. But as Maja Horst already in 2008 correctly claims, *“Controversies about science and technology are often understood as problems of poor communication between science and society”* (p. 259). While in previous times an approach has been chosen simply to deliver information from ‘top down’ – from scientist to general public – more and more approaches are engaging the target groups by addressing issues that are of real relevance for them. They invite for participation and take into account the target groups individual preferences and cultures. In addition they try to include the public’s perspective. However, many approaches are very disappointing, by labelling old activities simply with new, fresh terms. Having a closer look, most of the outreach activities base on old-fashioned concepts like lecturing content.

Thus one important perception for the scanning of the collected material is to find activities that are new to the target group. Also they need to relate closely to the audience’s preferences and attitudes.





Specific attention is drawn to the different target groups that are addressed by the outreach activities identified. NanOpinion aims to address difficult to reach stakeholder groups thus the interest in projects and initiatives that reaches out to these target groups is of high relevance. It is expected that many projects, especially FP7 Nanotechnology projects, are targeted towards researchers and stakeholders that are using Nanotechnology for their business. Therefore innovative and successful projects that go beyond these target groups shall be closely screened on:

- Adaptation of the language,
- Location of promotion or outreach activity,
- Selection of different tools for dissemination (i.e. internet, flyers, ...),
- Adaptation to (working) culture,
- Inclusion of supporting institutions or organisations,
- Level of stakeholder involvement in conception and organisation of activity

On the contrary, several criteria are classified as so-called, 'knock-out' criteria. These criteria would relate to rather old-fashioned dissemination activities that would not fit into the concept of innovative dissemination. Following **knock-out criteria** were identified:

- Stand-alone tools and games
- Stand-alone lecture/presentation
- Stand-alone paper
- Stand-alone non interactive school lessons
- Stand-alone opinion polls
- Stand-alone questionnaires
- Stand-alone exhibition in general

Many of these activities are well known dissemination tools and therefore too traditional in order to relate to the criteria of an innovative activity as long as they are not integrated in an innovative activity.



### 3. Screening of material

Within this section we describe the process of acquiring material for our assessment, the type of resources we used.

#### 3.1. Selection of material

In a first step of the screening process the selection of material is performed.

The material that has been screened during this process encompasses different kinds of sources aiming to reach a broad bandwidth of outreach activities that could be used and adapted for NanOpinion purposes. The material chosen was divided in FP 7 Nanotechnology projects, Science Communication Projects, live events, articles and papers, interviews and live visits of events. Each category aims to extract different results and insights:

	Expected results
FP 7 NT Projects	<i>A better understanding of NT project outreach activities in Europe</i>
Science Comm. project	<i>Insight into innovative outreach activities</i>
Live Events	<i>Understanding of (innovative) events and dissemination ideas in NT</i>
Articles/Papers	<i>Increased understanding of communication tools to be used in Nanotechnology</i>
Interviews	<i>Gain further insight into highly successful outreach activities in NT via additional qualitative data</i>
Visit of Events	<i>A better understanding about the work flows including the preparation, conduction and follow-up of outreach events in science communication</i>

Table 1: Outline of material and expected results

The data collection is organised in several steps and partly refers to the outcome of other deliverables and first analysis of material.

For the purpose of controlling all the different screening activities, supported by several partners, a Google document was established and continuously updated. This internal working document allowed all partners participating in this task to add and screen projects as well as check on the status of each activity. The file consists of several sheets, accordingly to the type of material that has been collected. Each sheet defines per outreach activity the name, a short description, location, comments, date, the responsible partner for the evaluation as well as the evaluation itself and indication if the data has been transferred for further analysis (MaxQda). An overview of the file with all the data sets can be examined in annex 7.4.



### 3.2. Operationalization

First step in the screening of material for outreach activities was the description of criteria assessment, including the assessment method for screening outreach activities. The purpose of the criteria was to help assess and support the decision making process on the screening for innovative outreach activities. Certain issues from different work packages (mainly WP 4 and WP 5) are used to define some criteria. To define the set of criteria, the description of work was used to determine the requirements with respect to the fulfilment of the project major objectives and assumptions. At the same time some criteria on the character of the activity were defined (a) as well as formal criteria (b) that insured topicality, subject and innovation.

Both, general criteria as well as the criteria on the character of activity and a description of the activity (c) were gathered in an evaluation sheet. This sheet served the screening of all material (with the exception of the interviews). The sheet was fed into the main tool of MaxQda for further data analysis.

#### a) Criteria for activity (what is an activity?)

For the screening we defined criteria for activities as such as it has to have an **aim**, specifically the outreach and communication of Nanotechnology or science communication of emerging technologies. Also, there has to be something done, performed, carried out within an **action**. **Interaction** (it should enable at least the possibility for interaction), **innovation** (beyond traditional science communication activities) and the **Presence of an audience** (it can be face to face and live, but not necessarily) are specific characteristics that are required by the project and therefore specific characteristics of our activity searching profile. For rather practical or organizational purposes we included in the characteristics of activities the **level of organization** (any organizer, not necessarily the science community) and due to possible cultural differences the **location** (activities in Europe, with some exceptions).

#### b) Formal Criteria:

- Nanotechnology or at least emerging technologies have to be explicitly mentioned
- Period (no longer ago than 2005 or the starting date of FP7)
- Primary source of description available
- Innovative, beyond traditional according to internal understanding
- Target group oriented

#### c) Descriptive information:

The descriptive part of the evaluation sheet included a **description of the activity** that outlined the context of the activity like environment, target audience, necessary material, a.s.o.

An important aspect for the screening was to explicitly describe the **good practice example** in detail. In that way, the analysis was eased and good insight into the activity was given. Specific **recommendations** were included in order to point out any findings and outcomes of the activity. The **conclusions** allowed the extracting of results, ideas and possible actions for the NanOpinion project.



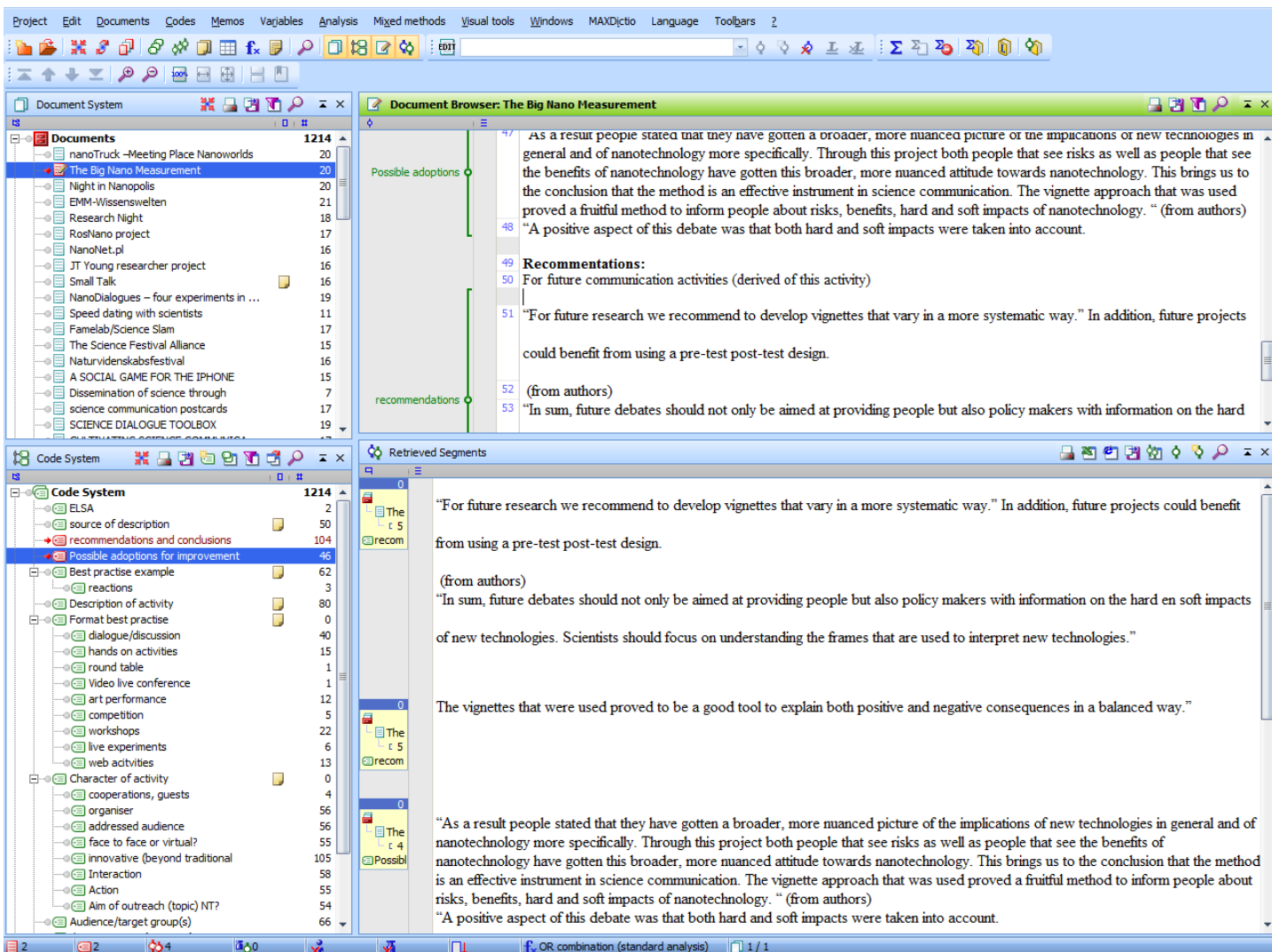


Figure 1: Screenshot of MaxQda file

All evaluation sheets were fed into MaxQda, a software for the analysis of qualitative data. There a code system according to the criteria for the activities, the formal criteria and the descriptive information was developed. All inserted evaluation sheets were analysed along the different codes.

### 3.3. Screening of Nanotechnology Projects

To identify potential projects and initiatives that relate to our criteria the FP Nanotechnology project list of D1.1. was extracted and analysed. Each project was scanned via its internet appearance and analysed via the criteria described before.

Out of this activity, we identified further projects that we included in the pool of listed projects. Within this process not only EU projects were added, but also outstanding projects from other continents. The rationale for this decision was that by a cultural adaptation valuable outreach ideas and activities could be collected.

Moreover, all partners were asked to investigate also for national projects that might be relevant for NanOpinion. Thus the list of Nanotechnology projects expanded further and



involved at the end of the screening 115 Nanotechnology projects that were screened and reviewed.

### **3.4. Screening of Science Communications**

For the purpose of identifying innovative good practice examples and ideas on how to successfully communicate science, a screening of different science communication projects was performed. The main sources for this screening were the PCST conference 2012 and the ECSITE conference 2012, two of the most renowned conferences in Europe. The advantage to use these two conferences was that the communication projects and papers were already screened and reviewed by experts in order to get accepted for the conferences. Hence the papers and projects presented there derived from trusted sources and high quality was assured.

Additionally a proactive search on recommended research communication activities led to 36 science communication projects and activities that were screened and reviewed.

### **3.5. Screening of Live events and Site visits**

A list of life events and site visits that were screened offered further insights into the practicalities and responsiveness of the audience.

*“The term ‘science event’ (SE) is often used in lieu of the longer term ‘science communication event’ (SCE). Even though the field of science communication continues to broaden, for the moment a precise definition of what does or does not constitute an SE does not exist.”* and further: *“... the term science event encompasses a whole group of diverse activities.”* (deSemir, Revuelta, Dimopoulos, & Peters, 2011, p. 16) citing after (Bohm & European Science Events Association, 2005). According to this definition, relevant Nanotechnology events were compiled within a list focusing on innovative and attractive outreach activities. The live events were identified via recommendations of partners as well as research from the internet and interviews with stakeholders.

While some events were evaluated directly by partners who attended the event (site visits), others were evaluated by using the information available on the internet (live events). As valuable addition, some events got further explained and discussed during the performed interviews (section 3.7).

In total 20 live events were screened and reviewed.

### **3.6. Screening of Articles and Papers**

The Office of Public Affairs and Research Communication, National Cancer Institute, National Institutes of Health has compiled a bibliography in Zotero containing 1236 articles that tracks peer-reviewed research (excluding book reviews, essays, and review articles) on communication strategies. For the screening all articles and papers that mentioned Nanotechnology were retrieved from this set of data also with the aim of identifying good practice activities.

The articles range from different communication strategies for Nanotechnology till critical voices on communication issues. This theoretical background material gives valuable input in





the design and tools for communication for WP5 and WP4 of NanOpinion. In addition, the articles and papers were used to identify further good practice examples.

In total 16 papers on Nanotechnology outreach activities were screened and reviewed.

### 3.7. Interviews

#### 3.7.1. Methodology - Process of Selection of Interview partners

The selection of interview partners was on first result of already performed analysis of FP 7 Nanotechnology projects and national projects that were scanned via the internet and evaluated with high ratings. In addition recommendations of project partners were taken into account, who had made very good experience with innovative outreach activities. Aim of the interviews was to find out more on the selected good practice activity that was not available screening the published material.

Hence, qualitative data was collected via structured interviews with (Nanotechnology) science projects, conducted by the researchers of ZSI and STSSCZ via telephone and Skype. The questionnaire outlines for both, the interviewer as well as the interviewee the clear aim, namely to “... *find innovative best practise examples from the present point of view, not what has been seen as being innovative, but what can be still recommended or adopted for today’s needs.*” (Interview guideline).

Apart from the general information necessary (interviewer, interviewee, time, date, location), the interviews investigate following themes (pl. see Annex 7.2):

- a) **Description of the outreach activity**
  - i. Definition, characteristics of the activity
- b) **Basic information** on the outreach activity
  - i. Further details to activity (participation, location, specifics, ...)
- c) **Intention, target group**
  - i. Further details on Impulse, Initiator (sponsor), Organiser, Specifics of the target group addressed
- d) **How and what**
  - i. Core elements of the activity
- e) **Assessment** of the activity
  - i. Requests and questions came up from the audience
  - ii. Assessment of the activity in general
  - iii. Factors of success, hindering factors, barriers, difficulties, supporting issues
  - iv. Accompanying documentation
- f) **Personal Opinion**
  - i. Best or the worst experience? And why?



The questionnaire divides these themes into further (sub-) questions and is accompanied by comments that support the interviewer during the interview (i.e. knock-out criteria...)

The interviews reveal excellent insights about the basic conditions that have to be considered when launching outreach activities for Nanotechnology or science in general. The result fosters the understanding of patterns in the outreach and dissemination, its practical implementation as well as factors of success. The questions about motivators and barriers allow the researchers to elaborate a concept of innovative outreach activities for NanOpinion. Clearly, the results from the interviews provide an important input for the design of WP 4 and WP 5.

In total 6 interviews were performed from December 2012 till February 2013.





## 4. Results – What are good practice examples?

### 4.1. Characteristics of good practice activities

According to the operationalisation a set of characteristics that should be met by the good practice activities was determined (see 2.1). The aim of the activities considered as good practice was outreach and communication of science, in particular of nanotechnologies. Another characteristic of the activities was that an action had to take place. For example these have been workshops and conferences, but also web activities like the virtual dilemmas in Nanoyou or a moving vehicle as the nanoTruck, the Nanobus or the Nanoshuttle. Furthermore an activity considered as good practice should have offered at least the possibility for interaction. For example workshops, live experiments, interactive stations or video conferences with scientists have been mentioned in this context. Most actions were live activities and performed face-to-face, but also multimedia or virtual tools provide opportunities for direct interactions.

In the following section the characteristic concerning innovative and beyond traditional science communication as well as the different target groups are described in more detail.

#### 4.1.1. Innovative and beyond traditional science communication

Another important criterion of considered good practice activities are **innovative elements that are beyond traditional science communication**. The focus of the collected activities can be clustered in seven groups according to different elements:

##### 1. Outreach in public space/ not established locations

Activities described in this section can be summarised by outreach of science activities in public spaces. Such activities take place for example in science centres, but also in public places like cinemas or events like music festivals. Another approach is a mobile vehicle, that moves around and stops in public space. To get an insight of such activities they are shortly summarised in the following:

For the German project EMM Wissenswelten students prepared scientific content for other target audiences than in the usual school context and presented and discussed the content with citizens at a public event. The Lithuanian project Research Nights brings science in public places like cinemas and cafes. Another more common idea of outreach in public spaces are so called Nanodays. Beside the project Time for Nano also the US-American project NISENET Nanoscale organizes NanoDays, which is a week of community-based educational outreach events to raise public awareness of nanoscale science, technology and engineering throughout the United States. Another innovative outreach concept is the idea of a truck with a mobile lab that can be requested to visit different places. This kind of project was realised in Lithuania (JT Young Researcher Project), where a truck goes through Lithuania with an educational program and in Germany (nanoTruck) where a mobile truck visits different locations upon request and offers information material and workshops. Another innovative approach for outreach could be found in the science communication project “Science, physics”: Scientists offered informal communication in the form of speed dating on music festivals. The so called Night in Nanopolis is a show that fuses science



lectures and live experiments about nanotechnology combined with dance, rock music and visual art elements.

## **2. Events that are not scientific in their primary purpose**

Activities summarised in this section are not only targeted on the communication of nanotechnologies as such, but also on science communication in general and are characterised by bringing science into different forms of cultural events. So for example a core characteristic of the Science Festival Alliance is the start of the activity from the event side and not from the science side. In general science communication activities in this section are characterized by a very intense reference to arts. This can be via the channel theatre (Science theatres, Communicating evolution through theatre: The case of Darwin's Journey), via the channel music (Communicating Science through music, Science, physics), via contemporary art (Nanoscope) or via art in general (Nanoart 21, ISWA).

## **3. Interactive activities**

Another innovative approach was the use of interactive tools and creating an exchange along different activities. For example in the Nanoyou project a range of interactive resources were developed and applied in pilot schools and science centres. A second example is the Macospol project that provided non-linear information on the basis of self-organisation to be explored from different perspectives.

Various other projects developed innovative games and tools to encourage the communication of nanotechnology and science in general. For example in the FP7 project FUND the approach of a game is used as a method for science communication, inspired by PlayDecide. In the project Democs a game like method with conversation cards is used. In this case games are developed and used as tools for fostering critical thinking. Interactive tools are also used to simplify the possibility to get in touch with information on science, e.g. FindNano is an iPhone applet to find products that use Nanotechnology.

## **4. Participatory dialogue oriented activities**

The activities summarised in this section are focusing on dialogue and discussion with different stakeholders and the integration of the target group in a participative and innovative form. For example one focus was to foster dialogue in an experimental way, e.g. in the project Nanosoc four successive participatory rounds took place in which each actor was asked to contribute his views with those of others. The project NanoDialogues developed and carried out dialogue experiments for public engagement. Another innovative dialogue approach could be seen in the project Nanologue, where NT future visions were developed and discussed between different stakeholders and the civil society. In the Italian project *scienza attiva* students got in dialogue with experts and developed recommendations out of that. On the other hand the citizen dialogue in Munich used an encouraging moderation style for a round table discussion with integration of the audience.

Also projects focused on science communication in general used innovative ways of dialogue and communication. Concerning this matter the peer to peer communication in the Swedish



project Naturvidenskabsfestival can be mentioned as well as other possibilities of science communication like science communication postcards, a science dialogue toolbox, science cafes and intermediators between scientists and general public.

Not only the focus on content related issues is important in this case, also the target oriented approach can be an innovative element. For example the science cafes in the nanotrail project seek active participation of target groups. Also the project citizen science@Bristol can be mentioned in this regard, as the integration of the different stakeholder groups was a main characteristic.

## 5. New ways of learning

In various projects the aspect learning was dealt with in an innovative way. In this regard the already mentioned project Nanoyou, but also Nanochannels used interactive approaches to bring students in contact with nanotechnology. In the project CIPAST case studies for learning were developed. The project Nano2market used a combination between toolbox and trainings to fulfil the aspect of learning. In Denmark university students organised Nanoshows for highschool students. In the project Ethicschool different topics were discussed in an innovative way to foster controversial thinking.

### 4.1.2. Target groups

Most of the good practice activities addressed the **general public**, including museum and science centre visitors as well as consumers. As the general public is a very common term it is difficult to assess which audience is generalised within this term. The second important target group were **young people**, mostly addressed as school classes through school activities. Also teachers and partly parents were addressed with such activities. Beside school students also university students and university teachers were addressed. The third big stakeholder group addressed by the good practice activities were **NT-experts**, including researchers, the scientific community and NT-specialists in general. Furthermore the audience of good practice activities consisted of **companies or businesses**, which in detail means enterprises, entrepreneurs and employees. Other stakeholder groups addressed by good practice activities are policy makers, enterprises and industry, NGOs, EU-projects, trade unions and various not specified other stakeholders.



## Target groups addressed

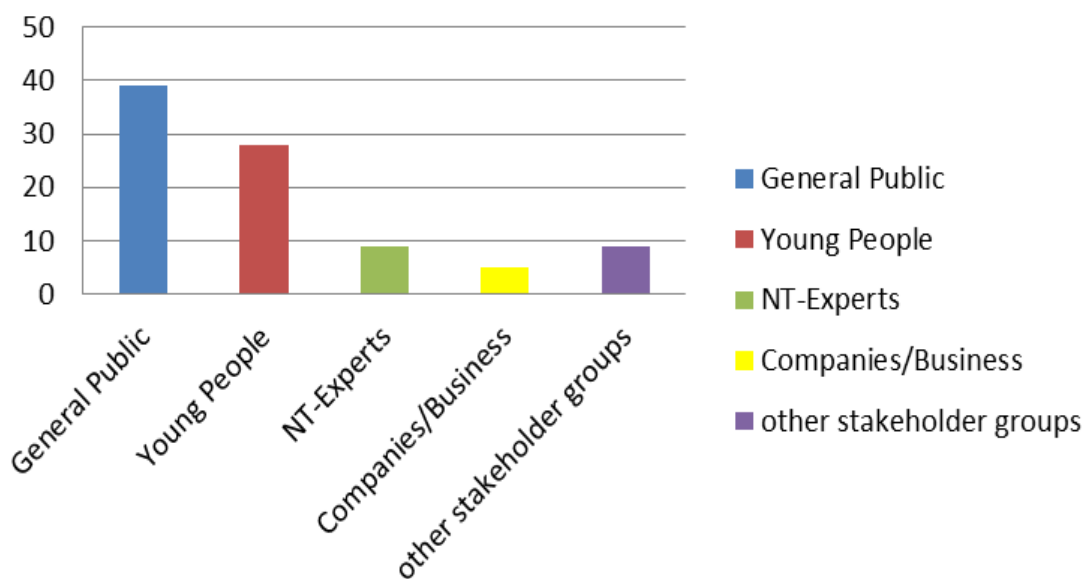


Figure 2: Target groups addressed

In general most of the good practice activities had more than one target group. So for example the NanoTruck project addressed schools and students in the first place, but also the general public and enterprises in the second place.

Nevertheless different stakeholder groups were addressed by the good practice activities, it seems interesting that exceedingly few activities are aimed at explicitly addressed target groups, at least at difficult to reach groups, but the general public. Of course this raises the questions what intention is behind this approach.

As mentioned above, difficult to reach groups were not explicitly considered. The reason may be that these groups are included within the term general public, but no activity namely addressed elder citizens, migrants or distant rural communities.

### 4.2. Formats

In chapter 4.1.1 the main characteristics of the assessed activities were clustered and described in groups. This chapter is dealing with the formats used for innovative outreach activities, which means which formats are implemented within the activities. A more detailed description of the selected good practice examples of the assessed outreach activities will be given in chapter 4.3.

#### 4.2.1. Dialogue/discussion

Although dialogue and discussion rather seems to be a very traditional format for science communication, these methods can also be used in an innovative way to develop attractive outreach activities. It still seems to be the most used format for science communication and outreach activities, but additionally to the “conservative” form of discussion and dialogue various innovative and experimental elements were developed and tested as well as implemented:



- **Bringing together different target groups:** e.g. students getting in contact with experts, students getting in contact with lay public, citizens getting in contact with policy makers etc.
  - Citizens help in defining the debate on NT by passing their views and policy preferences to policy makers at national and international level
  - Informed dialogue involving the key stakeholders
  - Get into discussion and dialogue with researchers
  - Debates with participating scientists and artists
  
- **Reversal of roles,** turning lay persons into experts: e.g. seeing students as experts
  - Lively discussion between pupils and visitors of event that pupils organised
  - Training lay publics in the local community as science communicators
  - Discussions among the local public
  - The main public considering role as citizens
  
- **Participatory development/creation of new discussion and dialogue formats**
  - Creation of new discussion formats and games
  - Mix of adapted methods
  - Stimulate public engagement in science communication and dialogue about nanotechnologies
  - Participants contribute in discussion with their views faced with those of others
  - Initialises ELSA discussions with Roleplay, which helps students to consider different stakeholder opinions
  
- **Combination of different elements,** like learning, exchange/discussion with others, formulation of recommendations to policy makers
  - Participants learn new information, discuss the topic with other participants and can vote on policy options they would recommend to decision makers
  - Dialogue with experts and development of recommendations by students
  - Participants work in small groups to discuss and design participatory process within a real life context
  - Development of video, discussion about values materialised in videos, presentation of outcome to wider public



- **Creation of neutral places**, that offer possibilities for exchange and discussion
  - Exhibition module as an ancient “agora”, a public area to meet, discuss and concentrate, an area where visitors could compare their ideas, opinions and points of view
  - Implementation of “communication centre”: discussion with visitors of exhibition
  - Initiate a broad, societal dialogue in which different views can be expressed freely
  
- **Facilitated workshops** are specific forms of discussion and dialogue settings. Workshops have defined goals and are addressing an invited round of participants, that do not exceed a certain number. Innovative development and implementation of workshops are especially linked to the performance of the facilitator/moderator. In all good practice examples assessed for this report the role of the moderator was crucial:
  - The moderator arranged a setting that enabled for interaction, invited the audience to come closer and the experts to move from behind the tables in a circle with the audience
  - The moderator addressed and involved the audience from the beginning
  - People were encouraged not only to ask questions but also to give comments and statements
  - The moderator tried to make sure that the audience also got room for participation.
  - The moderator made sure to discuss with scientific accuracy and enabled discussions
  
- **Other experimental approaches:**
  - Speed dating sessions
  - Communicate and foster dialogue by postcard
  - Science dialogue toolbox
  - Initiating active dialogue through science café
  - Round table discussion with experts, whereas moderator is experienced in risk dialogue activities.

#### 4.2.2. Hands-on activities

Hands on activities offer the possibility to get in straight contact with the field, to try autonomously and to self-experience it. It is a format that allows for direct access to science and raises the interest of the target group. In the selected good practice examples hands-on activities are mainly used for young people, but also for the general public, e.g. in the framework





of exhibitions. Concerning the collected good practice activities two main types of hands on activities can be identified:

- **Hands-on exhibitions/exhibits**
  - Some simple hands-on exhibits, demonstrated and explained by pupils, not only for peers but also for other visitors of the event
  - 90 exhibits and interactive stations on two levels
  - During introduction of citizen dialogue tangible objects and examples were passed through the audience
- **Hands-on experiments**
  - Students were given six carefully selected tasks to complete during the session and these were each related to the work of the visiting scientist
  - Hands-on lab experiments – most successful instruments, interactivity and possibility for trying and observing effects are appreciated
  - School classes working on experiments
- **Others**
  - Production of short film clips
  - “open house days” for the interested public, visitors can investigate self -brought along things with the scanning electron-microscope

#### 4.2.3. Web activities

Web activities play an important role when it comes to outreach and communication of science. To be considered in this good practice report the interactive approach of the web activities was a precondition as interactivity offers the possibility to get in communication with the target group addressed. Various activities happen on the web. There are for example competitions, virtual tools and games as well as interactive mind maps:

- **Online Competitions**
  - NanoArt 2012 international online competition
  - Video competition
  - Quiz with prizes





- **Tools and games**
  - Interactive online toolbox
  - Virtual tools like virtual dilemma/dialogue – highly accepted by students and teachers
  - Online Game
  - Web based nano-communication tool – visitors are invited to wander into the world of nanotechnology.
- **Mind Maps**
  - Interactive mind maps to give a well-structured overview of the different dialogue approaches
  - A kind of mindmap showing different subjects, questions, and arguments on nanoparticles - Visitors can zoom in and choose from which perspective they want to get further information.
- **Other web material**
  - Blogs
  - Online exhibition
  - Opinion polls that can be used online
  - NanoKit, which offers an introduction to the world of nanotechnologies and nanosciences through entertaining and interactive activities
  - Webinars

#### 4.2.4. Art performance

Art can take on many forms, also when it comes to outreach and science communication. Forms of arts used for outreach and science communication were theatres, music, shows and festival, classic artworks like paintings and sculptures, but also contemporary art or new media. The linking element is always the relation to science in general and nanotechnologies in particular that is established in different ways:

- Music as pedagogical tool for teaching science and math
- classic (painting, sculpture) and new media (videos, interactive animations) artworks, utilizing nanotechnology conceptually and/or technologically
- Contemporary art inspired with nanotechnologies
- New artworks have been developed in the interdisciplinary setting of artists and nano-scientists. Several artworks were tailor made for specific exhibition spaces/themes and installation designs.
- Microscope records turn into art objects and represent diverse impressions of the nano cosmos



- Show events and site specific performances with art-science dramaturgy fusing nanoscience lecture and experiments with dance, music and visual art

#### 4.2.5. Competition

Competitions assessed within the good practice cases are target group tailored in general, but mostly young people are addressed with such activities. Compared with hands on activities also competitions are an instrument to get in direct contact with the related field of science respectively nanotechnologies, and to discover elements on one's own. Often competitions are performed in connection with web activities and lead to expressions via art elements. For participants and especially winners incentives and prizes are provided:

- International youth contest in art inspired by science/nanotechnology for young people
- Picture contest "my intelligent environment" announced in 6 languages through the web portal; attractive incentives like money prizes and participation of pictures in exhibition travelling Europe, visit to Intelligent Environment Research Laboratory
- Annual competition for schools on nanotechnology
- Nano&art competition for women

#### 4.2.6. Real lab experiments

Real lab experiments give a direct insight to scientific work and show technological/chemical/physical processes on site. In contradiction to hands on activities, where the target group directly gets in touch with the subject, experiments are demonstrated by specialists, which offer the possibility for live-questions. Deriving from the good practice activities assessed, live experiments are either performed at several sites outside the lab, e.g. in science centres or schools, or via video. For example for the last case there was observed a video live conference with a laboratory at a university, where two PHD students were showing and explaining a nanotechnology experiment.



### 4.3. Description of good practice activities

In total 62 innovative science communication activities were identified and analysed. Based on the analysis and the assessment of the criteria, characteristics and descriptions of the activities good practice activities were selected, whereby all groups of formats and main target groups addressed were considered. The detailed description of the good practice activities is given in the following section.

#### 4.3.1. The Big Nano Measurement – Nanovignette

<b>Project</b>	The Big Nano Measurement, Nanovignette (part of Nanopodium)
<b>Date</b>	2010
<b>Location</b>	Netherlands
<b>Innovative, beyond traditional</b>	Focus on soft impact of nano, stimulating opinion building
<b>Target group</b>	Randomly selected audience, through online channels and radio broadcasting
<b>Format</b>	Web activities
<b>Link for further information</b>	<a href="http://www.nanometing.nl/">http://www.nanometing.nl/</a> (no longer available)

The Big Nano Measurement is part of Nanopodium, a research project on the influence of nanotechnology science communication on opinion building. The Big Nano Measurement was a fourteen weeks online project, involving 1164 Participants through online banners and radio broadcasting.

Nanovignette - another project funded by Nanopodium – was taken up by The Big Nano Measurement. Vignettes are stories or scenarios that describe a possible outcome of the application of nanotechnology and should help broaden the discussion away from the exclusive focus on nanoparticles and health risks, by opening up for discussion how nano-enabled technologies might affect us in our daily lives.

Within The Big Nano Measurement every week another vignette was introduced online, through a quick sketch of possible applications of NT. Subsequently participants were asked whether they would like that application. Then, the vignette continued describing different hard and soft impacts of the application of nanotechnology. After each paragraph participants were asked about their opinion with regard to nanotechnology. In order to keep the discussion lively the participants immediately received feedback on their responses compared to the responses of other participants. At the end of each week participants were asked if they had changed their mind as a consequence of the new information they had received.

This first part of the project served as way to make sure that people are able to develop an opinion in a well-informed way and think about how it should be introduced in society. After thirteen weeks the second part of the project started and the participants became respondents in a survey.

Organisers of the activity summarize that the vignettes that were used proved to be a good tool to explain both positive and negative consequences in a balanced way. But for future research they also recommend to develop vignettes that vary in a more systematic way. Also on the



target group some recommendations were made: Future debates should also be aimed at providing policy makers with information on the hard and soft impacts of technologies.

#### 4.3.2. EMM Wissenswelten

<b>Project</b>	EMM-Wissenswelten (Universität Augsburg) – Presentation and interactive booth of the seminar on nanotechnology of the Jakob Fugger Gymnasiums
<b>Date</b>	15.7.2010
<b>Location</b>	Augsburg, Germany
<b>Innovative, beyond traditional</b>	School goes out in the street, students prepare for other target audience than pupils, teachers or parents
<b>Target group</b>	Youth (school classes – students and professors) and citizens
<b>Format</b>	Dialogue/Discussion, hands on activities
<b>Link for further information</b>	<a href="http://www.jakob-fugger-gymnasium.de/web/index.php?option=com_content&amp;view=article&amp;id=658:emm-wissenswelten-universitaet-augsburg&amp;catid=129:nanotechnologyifg&amp;Itemid=238">http://www.jakob-fugger-gymnasium.de/web/index.php?option=com_content&amp;view=article&amp;id=658:emm-wissenswelten-universitaet-augsburg&amp;catid=129:nanotechnologyifg&amp;Itemid=238</a>

For the 40-year jubilee of the University of Augsburg an event with around 100 activity oriented and interactive offers took place. One of the activities was especially on nanotechnologies and was designed and organised by the students of the Jakob Fugger Gymnasium.

Some simple hands on exhibits (like a lego model of an atomic force microscope, some examples of lotus effect with different surfaces, red gold, nano lighting and nano sun cream) were, developed, demonstrated and explained by the pupils, not only for peers, but also for other visitors of the event, which had a big publicity because of the 40 year jubilee of the university. These formats required a high involvement and engagement of the pupils and offered for visitors the possibility to experience hands on. Furthermore the open format of demonstration and explanation by the students led to lively discussion between pupils and visitors. Thus both, the organizing pupils as well as the by-passers, gained much learning.

Recommendations for improvement refer to the integration of more exhibits and to offer a possibility for feedback for the visitors.

#### 4.3.3. ISWA – Contemporary and performing art

<b>Project</b>	ISWA - Immersion in the Science Worlds through the Arts
<b>Date</b>	2011-2013
<b>Location</b>	Prague, Pardubice - Czech Republic, Vienna - Austria
<b>Innovative, beyond traditional</b>	Nanoscience and -technology outreach mediated through different Art disciplines
<b>Target group</b>	General public, youth (14-19 years old)
<b>Format</b>	Art performance, competition, real lab experiments
<b>Link for further information</b>	<a href="http://www.utesla.cz">http://www.utesla.cz</a> , <a href="http://www.iswaproject.eu">www.iswaproject.eu</a>



ISWA is an experimental project on science communication through arts. There are two main activities:

- Development of tailor made contemporary visual art works, films, dance choreographies of science phenomena by professional artists and scientists
- Performing public exhibitions, screenings and dance shows; organising dedicated workshops and seminars; disseminating AV material; all with the aim to motivate young people from 14-19 years. to produce art inspired by science and to participate in an international contest

Within the project several events with particular focus on nanotechnology were already performed:

- Exhibitions of more than 150 professional artworks from 44 Czech and foreign artists at the New Stage of the National theatre in Prague (NanoPOLIS), and Faculty of Chemical Technology University of Pardubice (Nanoscope Redux)
- Two featured shows “Night in Nanopolis” at New Stage of the Czech National Theatre and a site specific performance NanoPOLIS@TUWien (TU Vienna), fusing live nanoscience lectures and experiments with dance, music and visual art
- Art film with seven stories, whereas one episode was on nanotechnology
- Public workshops and seminars (including Pecha-Kucha) with nanoscientists at the University of Pardubice

As good practice example serves especially the contemporary and performing art that is utilized to stimulate young people’s interest in nano science & technologies as well as raising awareness of the general public. Different communication elements are used for achieving this purpose:

- artworks, both classic (painting, sculpture) and new media (videos, interactive animations), utilizing nanotechnology conceptually and/or technologically
- accompanying textual installations on nanotechnology
- feature show events and site specific performances with art-science dramaturgy fusing nanoscience lectures/experiments with dance, music and visual art
- accompanying program in the form of Pecha Kucha seminars and debates with participating scientist and artist, students workshops, guided tours through the expositions
- International youth contest in art inspired by science/nanotechnology for young people from 14-19 years.

More than 40 new artworks including five dance choreographies have been developed in interdisciplinary settings of artists and nano scientists. Several art works were tailor made as site specific designs e.g. for New Stage of the Czech National Theatre.



It was found that Contemporary Art is progressive and inspiring communication tool deserving broader utilisation in communication outreach of nanotechnology.

When it comes to possible adoptions for improvement more integration of social media and further activities for deepening public engagement in communication, e.g. discussion games, are recommended to better harvest the simulative effect of the arts. The rather extensive approach in terms of involvement of arts in the communication was chosen mainly due to the piloting character of the activities. In the future a more focused and more integrated approach seems to be the way to enhance the efficiency of the outreach activities.

#### 4.3.4. Small Talk - Young People's Parliament and Schools' debates on nanotech

<b>Project</b>	Small Talk – discussing nanotechnologies
<b>Date</b>	2004-2006
<b>Location</b>	UK
<b>Innovative, beyond traditional</b>	Involvement of target group in shaping of activities
<b>Target group</b>	School students
<b>Format</b>	Dialogue/Discussion
<b>Link for further information</b>	<a href="http://www.smalltalk.org.uk/">http://www.smalltalk.org.uk/</a>

Small Talk was a three-year long collaborative project, that looked at the benefits for the science communication community in working together on dialogue activities for an ‘upstream’ issue — nanotechnology. Around 20 documented events took place at different places across the UK, addressing different target groups. Different communication methods were used and various experts were invited. Guidelines based on lessons learned throughout the activities were carried out to be provided to other organisers of nanotechnology discussing events.

Two events of the project are especially considered as good practice examples:

##### **Young People's Parliament (Birmingham)**

In March 2006 around 70 school students between 13 and 18 years visited the one day-long event. Students took part in an e voting quiz and were informed by specialists. Then they participated in workshops that addressed aspects of the science, social science implications and the role of Government departments. In the afternoon students had an opportunity to debate the issues raised throughout the day, poll their peers with the e-voting and to question a member of parliament.

To get participants' opinions, different methods were implemented:

- pre and post electronic voting was conducted. One of the workshops involved the students in developing questions to vote on at the end of the event aiming at being useful to science policy makers.
- a questionnaire using speech bubbles
- a focus group discussion three weeks after the event





Birmingham was chosen to try three particular things:

- Participating experts should see learn from the students rather than just teaching them
- There should be the chance for participants to discuss informally, in small groups and without agenda
- It should be tested the extent to which participants could set their own agenda, so they allowed group discussion to determine the shape of the plenary discussion at the end.

### **Schools' debates on nanotech for Brighton Science Festival**

In February 2006 thirty-four year 10 students participated at the schools' debates. The students were given six carefully selected tasks to complete. Each task was related to the work of a visiting scientist. At the start of the session an introduction describing nanotechnology on students' level was given by the visiting scientist. Also a document entitled "Speaker's brief" was given. Then the students were asked to work in small groups to gain consensus on three questions.

The feedback of the participants showed that there is the desire of more interactivity, although it was planned that at least two thirds of the activities should be interactive. A clearer framing of the issues and explanation of the purpose of the events may have reduced the frustration of some of the participants. Rather successful assessed was the strategy for encouraging the participants to shape the plenary discussion, which applies in particular for the Birmingham event.

#### **4.3.5. Nanoyou - Virtual tools, Role play and video scenario workshop**

<b>Project</b>	Nanoyou
<b>Date</b>	2009 - 2011
<b>Location</b>	Europe, Israel
<b>Innovative, beyond traditional</b>	Range of interactive resources, applied at pilot schools and science centres
<b>Target group</b>	Young people, including students (10-21 years), teachers
<b>Format</b>	Dialogue/Discussion, hands on activities, web activities, competition
<b>Link for further information</b>	<a href="http://www.nanoyou.eu">http://www.nanoyou.eu</a>

NANOYOU aimed to increase young people's basic understanding of nanotechnologies and to engage in the dialogue about its ethical, legal and social aspects. Various materials were developed and implemented in a range of diverse outreach activities. Three of the activities were selected and are described as good practice in the following:

The NT **virtual dialogue** was designed as a platform that enhances students' effectiveness in contributing to discussions about NT ethical dilemmas and policy issues. Six different NT virtual dilemmas were developed and presented on the webportal using flash techniques. The students were asked to offer an opinion about each dilemma and it was intended that they justify their opinion by using knowledge they have acquired about NT through other activities. They uploaded their argumentation with the NT explanations and justification to a dialogue box on





the project website, where they could respond to each other. Each dilemma was presented on the webportal through three relevant situations and aspects that the students had to follow in a sequence. The first situations described a problem or a specific human need. The second situations described the nano solution to the problem (benefits) and the third situations described the possible impacts (effect) of the solution (risks). The situations were presented through texts, pictures and animations. The three situations were followed by a dilemma which the students had to respond to, make a decision and justify it. The students responded to the dilemma in a dialogue box template which was then uploaded to the Nanoyou portal and could be commented by other respondents.

Following the evaluation results the virtual tools in general were highly accepted by students and most of the teachers. But implementing virtual tools is highly related to teachers' habits and availabilities of infrastructure at schools and at students' homes. Real life examples worked best, e.g. nanosocks were used mostly. They support ELSA discussions and they are attractive in terms of animations and illustrations. Life dialogues allowing for direct exchange between students or schools would be requested. In general the virtual dialogue is more appropriate for elder students above 14 years. More applications especially relevant for the daily life of the young target group and examples of different fields of applications would be required.

The **role play game** was designed for using cards that serve as a tool that enables small groups of participants to become engaged with complex public policy issues. In total ten different NT dilemmas were developed, for the grade level 11-13 years and 14-18 years. While participating in an NT role play, each student chooses one of the stakeholders' roles. Some of the stakeholders represent professionals while others represent roles of their everyday lives such as parents or consumers. Also there is place for the students to express their own personal point of view. The students study the dilemma and the stakeholder's opinion through the designed cards. The goal is to gain a better appreciation of the differing viewpoints of the various stakeholders, which is an important element in reaching reasonable decisions. Then the students present their stakeholder's opinion and discuss it within their NT-dilemma group. At the end the group presents a summary of their main ideas to the class.

As results of the evaluation activities it was found out that the role play game initialises ELSA discussions and helps students to consider different stakeholder opinions. Group discussion results should be intended. Teachers assess the role play as being more useful than students. It is more suitable for elder students and it needs time and additional information to prepare for the roles. Teachers from other disciplines could support the discussions.

**Video scenario workshops**, including discussion and presentation event: A 48 hours' time-limited video contest took place. Six teams of three were enrolled with a multidisciplinary background: Engineering, art history, communication, video technique, social sciences, story boarding, architecture, science education, decorative art etc. Participants spent day and night to transform innovative stories into 3' films. Four videos were nominated by a participative jury. The Creators were invited to present the films at the Nanoyou's public debate in Paris.



#### 4.3.6. NanoSoc – Successive participatory rounds

<b>Project</b>	NanoSoc - Nanotechnologies for Tomorrow's Society
<b>Date</b>	Until 2009
<b>Location</b>	Belgium / Flanders
<b>Innovative, beyond traditional</b>	<ul style="list-style-type: none"> <li>• four successive participatory rounds; each actor was asked to contribute his views faced with those of others</li> <li>• citizen's panels on "nano imaginaries"</li> </ul>
<b>Target group</b>	Researchers, citizens, other stakeholders
<b>Format</b>	Dialogue/Discussion
<b>Link for further information</b>	<a href="http://www.nanosoc.be/Home-en.asp">http://www.nanosoc.be/Home-en.asp</a>

The project Nanotechnologies for Tomorrow's Society (NanoSoc) brings together nanotechnologists, natural and social scientists, stakeholders, and citizens to discuss and reflect on the opportunities and challenges involved in the constructive social shaping of nanotechnologies in three particular fields of application: smart environment, bio on chip, and new materials.

One activity in the project, considered as good practice, were **four successive participatory rounds** in which each actor was asked to contribute his views faced with those of others. In the first stages of the project (exploring and designing nanotechnology trajectories), they used a three-round Delphi study with scientific experts and citizens. The generated outcomes were translated into future scenarios and presented to all participants for critical examination in a scenario workshop. Stakeholders were then asked to apply a value tree analysis to come up with a shared image of a sustainable nanotechnology future. Scientists in turn performed vision assessment to reflect on the possible strategies that can contribute to realizing that future. Checklists with points of attention for sound process and content management were drafted and then applied throughout all the research stages, to help develop sensitivity to social learning effects and evaluate the interactions of the participants. An impact assessment of the social learning process on existent research practices took place prior to, during, and after the numerous interchanges. To this end an institutional analysis complemented with semi-structured in-depth interviews with key actors was used.

As conclusion it can be summarised that this activity is very specific designed but not well targeted for broad outreach.



#### 4.3.7. Nanologue – Three scenarios

<b>Project</b>	<b>Nanologue – European wide dialogue</b> looking at the social, ethical and legal implications of nanotechnology.
<b>Date</b>	2005-2006
<b>Location</b>	Europe
<b>Innovative, beyond traditional</b>	Method of developing NT future visions
<b>Target group</b>	researchers, business, the civil society
<b>Format</b>	Dialogue/Discussion
<b>Link for further information</b>	<a href="http://www.nanologue.net/">http://www.nanologue.net/</a>

Based on extensive research and stakeholder consultations, the project developed several products to enhance the dialogue about social, ethical and legal aspects for nanotechnology applications, amongst others three Scenarios of how nanotechnology will have developed by 2015. In advance of the development of the scenarios moderated dialogue sessions were held to discuss and exchange opinions on an inclusive and neutral way. Furthermore interviews with experts contributed to the findings of the discussion sessions. The insights of the discussions and interviews were translated into three future-scenarios.

The **scenarios** should assist people interested in nanotechnology to think about its place in society in a structured way:

- In the first scenario, Disaster Recovery, a lack of regulation results in a major accident. Public concern about nanotechnology is high and technology development is slow and cautious.
- In the second scenario, Now We're Talking, strong regulation and accountability systems are in place. The technology has been shaped by societal needs and strong health and safety concerns.
- The last scenario, Powering Ahead, entails scientific progress, which occurs faster than expected. Nanotechnology is making a real impact, particularly in energy conversion and storage.

Summarised it seems to be an interesting methodology to use future scenarios as ground for more discussions and to form opinions on nanotechnologies. An interesting approach would be to see what opinion people have before and after the discussion of the scenarios.



#### 4.3.8. CIPAST – Case studies

<b>Project</b>	<b>CIPAST.</b>
<b>Date</b>	2005-2007
<b>Location</b>	Europe
<b>Innovative, beyond traditional</b>	Case studies for learning
<b>Target group</b>	Different stakeholders
<b>Format</b>	Dialogue/Discussion
<b>Link for further information</b>	<a href="http://www.cipast.org/">http://www.cipast.org/</a>

Aim of CIPAST was to enhance dialogue on nanotechnologies and nanosciences in society at European level, in detail, how to design a participatory process for a consortium of science centres and science museums (based in several European countries) on an emerging issue at the European level.

For the activity, considered as good practice, participants worked in small groups to discuss and design a participatory process within a « real life » context, and also present the results of their debates in plenary sessions. CIPAST members facilitated this session and provided assistance to case study participants. They were introduced to the context of the NanoDialogue case, along with a brief discussion of nanotechnologies and nanosciences (N&N). Participants then considered how to achieve the core aims and objectives of the proposed initiative, which are:

- To provide information and raise awareness among the general public on the latest research in nanotechnologies and nanosciences
- To implement social dialogue between the research community, civil society and citizens; with design and use of high quality communication tools and participatory methodologies

To identify the main issues and preoccupations concerning nanotechnologies and nanosciences Case study participants incorporated factors such as the available budget, the timescale given, and the utilisation of the existing project partners. They were asked to bear in mind a number of planning steps that may assist the design of their methodology, including issue framing, implementation, and evaluation, and also to explain the rationale of their choices. The final stage of the design involved drafting a press release for the announcement of the launch. This case required 5-7 hours: an introduction of 30 minutes to outline and elaborate upon the case; 3-4 hours of collective work in small group; 1-2 hours of presentation and debriefing.



#### 4.3.9. FUND/DECIDE

<b>Project</b>	FUND/DECIDE
<b>Date</b>	ongoing
<b>Location</b>	anywhere
<b>Innovative, beyond traditional</b>	Approach that uses game as method
<b>Target group</b>	Any stakeholders
<b>Format</b>	Dialogue/Discussion
<b>Link for further information</b>	<a href="http://www.playdecide.eu/">http://www.playdecide.eu/</a>

FUND is a two-year project supported by the European Commission to stimulate the use of discussion games and other debate formats in European cities for the development of a scientific culture at the local level. It supports the creation of new discussion formats and games inspired by PlayDecide and their use to address issues and topics that are important at city level. Training and support are provided to individuals and organizations that want to be active in the field of debate and discussion. Furthermore it uses a series of small subsidies to catalyse collaborations at the city level between networks, organizations and individuals who want to use debate and discussion to inform local policy.

FUND aims to facilitate the take-up of participatory methods, exchange experiences and knowledge, and embed them in the ongoing activities of those actors who interface the public with the governance of science: local administrations, museums, universities, networks, associations, community groups, NGOs, public/private research organizations etc. The instructions for playing and getting involved in this method are very simple to follow.

#### 4.3.10. Science, physics – Speed dating with scientists

<b>Project</b>	Science, physics,
<b>Date</b>	2008 ; 2012
<b>Location</b>	Portugal
<b>Innovative, beyond traditional</b>	Music festivals, presence of scientists, informal communication, speed dating
<b>Target group</b>	Music festival visitors
<b>Format</b>	Dialogue/Discussion
<b>Link for further information</b>	Leao, M. J., & Castro, S. (2012). Science and rock. How music festivals can boost the progress of science. EMBO reports, 13, 954–958.

For this activity a cooperation of two institutions - a music festival and a science institute - was implemented. At the music festival a booth was set up close to the main stage, where science related activities took place, e.g. extract DNA from strawberries, make flavoured ice-cream frozen in liquid nitrogen, sci-arts installations and photo exhibitions. Scientists mixed informal with festival visitors. Activities were disseminated on the music festival website and its facebook page, videos on you tube, website of IGC offering interaction with fellowship winners and the public.



Out of all activities especially the speed dating sessions serve as good practice example. Each session lasted five minutes and visitors could come three time. Often conversations went on for more than five minutes and the interactions were assessed worthwhile from all participants.

#### 4.3.11. Nanodialogue – Exhibition

<b>Project</b>	Nanodialogue
<b>Date</b>	2005-2007
<b>Location</b>	Belgium, Estonia, France, Germany, Italy, Portugal, Spain, Sweden
<b>Innovative, beyond traditional</b>	exhibition was organised in the form of an ancient “agorà”, a public area to meet, discuss and concentrate
<b>Target group</b>	schools, families (general public), industry/university
<b>Format</b>	Dialogue/Discussion, hands on activities
<b>Link for further information</b>	<a href="http://cordis.europa.eu/fetch?CALLER=EN_NEWS&amp;ACTION=D&amp;RCN=24075">http://cordis.europa.eu/fetch?CALLER=EN_NEWS&amp;ACTION=D&amp;RCN=24075</a>

The project Nanodialogue aimed at engaging the public in a debate on nanotechnologies and nanosciences while arising curiosity and stimulating a debate as well as letting visitors create their own opinions. There were four main activities performed within the project:

- Exhibition in eight different countries
- Events and debates
- Social Survey
- Final Conference,

whereas the exhibition serves as good practice example.

The **exhibition** communicates to visitors at different levels, in order to arise the largest interest.

There were three levels of messages within seven different sections:

- The first concerned the three great walls, and it included the appropriate artistic and graphic background with images related to the topic, the titles of the sections and the “Eight questions” on nanotechnology, as well as a double interview with answers from scientists with two different backgrounds.
- The second level concerned the “Information” panels, with scientific information on the different topics and the “ELSA” panels, where opinions of scientists, researchers, philosophers and other people with different background were given.
- The third level concerned the “in-depth” panels: more detailed material presented locally in “books”, labels, files, etc.

The exhibition was organised in the form of an “ancient “agorà”, a public area to meet, discuss and concentrate, an area where visitors could compare their ideas, opinions and point of view” (final report). In every section visitors could find the main information on the topic as well as





comments and opinions. This opened the opportunity for the visitors to confront their ideas and opinion with those of scientists, politicians, philosophers and science fiction writers.

The central table in the exhibition represented a space for debate and discussion and provided the opportunity for visitors to get in touch with real nano-objects. At the same time this space was also used for different events like science demos, focus groups and small debates with the aim to enrich the exhibition module and to involve visitors more actively into the debate.

In the final report of Nanodialogues was stated that the results show that the role of the exhibition as attractor for public debate is considerable. Exhibitions are also an instrument for science centres to reflect on the “value” of their visitors, “which lies not only in their numbers but also in the quality of the activities they engage in at the science centre and the kind of contributions they make”. Instead of seeing science centres and museums as “repositories of truth”, they can also be presented as a place for public debate and dialogue with the aim to develop of science instead of just acknowledging it.

#### 4.3.12. NanoToTouch – Open Nano Lab and Nano Researcher Live

<b>Project</b>	NanoToTouch
<b>Date</b>	2009 - 2011
<b>Location</b>	Germany, Italy, Sweden, Belgium, Estonia
<b>Innovative, beyond traditional</b>	Open Nano Lab and Nano Researcher live
<b>Target group</b>	Visitors of museums, school classes, Researchers
<b>Format</b>	Hands on activities, dialogue/discussion, real lab experiment
<b>Link for further information</b>	<a href="http://www.nanototouch.eu/">http://www.nanototouch.eu/</a>

*“NANOTOTOUCH is a project aimed at communicating nanotechnology through a completely new methodology, which is aimed at pushing science communication to its extreme. In fact, the revolutionary concept behind this project stands in the re-collocation of science from the standard perspective of a top-down communication, to a more active involvement of the public; thus science will no longer exist as a separated apparatus from the rest of society.”* (website). Within the project two activities serve as good practice example: Open Nano Lab and Nano Researcher Live.

The **Open Nano Lab** represented a space in which researchers work on their projects and conduct measurements “sharing with the public their results through an environment shaped to provide the most meaningful educational experience for all” (website). Each nanolab was a cooperation between a science centre or science museum with a local university. The science centre or science museum provided the space and the infrastructure and the university provided the instruments and the researchers to work in the lab. The researchers were mainly PHD-students from the local university and conducted their research in the science centre, live and in full view of the public. Visitors could ask questions and could get in direct discussion and dialogue with the researcher.





The main intention was to give the broad public an insight into how modern research works. Visitors had the opportunity to find out, how nano researchers feel about their work, what are their thoughts, their ideas and concerns, to see their everyday work life including difficult situations. A further focus was the enabling of face-to-face and live communication with the young researchers. Especially the young age of the scientists helped to enable a face-to-face and live communication with school classes more on a peer-to-peer level, which lead to much more effective dialogue without the traditional top-down approach.

It was found that communication and outreach was not just a benefit to the visitors but it was also a large benefit for the researchers that worked in the lab as they were able to learn and practice communication skills themselves. Due to the questions and the feedback from the visitors, the scientists started to think more about the context of their personal research in the wider field of nanotechnology and nanosciences and also in social and ethical context.

The **Nano Researcher Live** provided the opportunity for the broad public to meet nanotechnology researchers in a science centre within the course of a permanent nano-environment (e.g. exhibits, demonstrations and interactive presentations) including a live presentation area, where local nano-researchers explain and discuss their work in a public forum. All live programmes had a similar structure: They started with a presentation given by the expert, including nano-demonstrations, nano-objects, films etc. Following the presentation there was time for questions and discussions respectively the dialogue between the public and the scientists, moderated by the coordinator of the event. Even ethical, legal and social issues should be included in the discussion.

Before and/or after the main event further time should have been dedicated to presenting nano-demonstrations or explaining nano products and getting in dialogue with the visitors.

#### 4.3.13. Nano4Women - nano&art contest

<b>Project</b>	Nano4Women
<b>Date</b>	Ongoing since 2007
<b>Location</b>	Germany
<b>Innovative, beyond traditional</b>	Female target group, science turns into arts
<b>Target group</b>	Female Students right before leaving school, female entrepreneurship
<b>Format</b>	Art performance, competition
<b>Link for further information</b>	<a href="http://www.nano-4-women.de">http://www.nano-4-women.de</a>

nano4women is a German network, consisting of competent and committed partners from science, economy and politics with the aim to support women in their professional and scientific career in the field of nanotechnologies. There are different activities implemented, e.g.

- Nano-Entrepreneurship-Academies for people that would like to start a business with Nanotechnology
- Student orientation academies: The Academies last for 7 days. Social competences are trained, first mini-science tasks in a team performed and together with a female mentor



the decision on the future profession of the girls is taken. Especially the idea on having a scientist as tutor for students is seen as an interesting approach.

Considered as good practice activity is the **nano&art contest**, which is a contest for visualisations from the nano-cosmos and for women only. Microscope photos are turned into art objects and presents different impressions of the nano-cosmos. To avoid their disregard and to open it to the public, the contest nano@art was implemented. Aim of the contest is on one hand the public positioning of young female scientists and on the other hand to open the access to the future oriented nanosciences. The contest is open once a year and attractive prizes can be won.

#### 4.3.14. Democs

<b>Project</b>	Democs (Deliberative Meetings Of CitizenS)
<b>Date</b>	March 2007
<b>Location</b>	UK
<b>Innovative, beyond traditional</b>	Innovative approach with conversation card activity (Attention – it is game like) any reason for knock out?)
<b>Target group</b>	Students 16+
<b>Format</b>	Dialogue/Discussion
<b>Link for further information</b>	<a href="http://www.scienceinschool.org/2007/issue4/democs">http://www.scienceinschool.org/2007/issue4/democs</a>

Democs (**DE**liberative **M**eetings **O**f **C**itizen**S**) is a conversation card activity with the aim to promote discussion of controversial topics in science. Each Democs kit is written on a specific topic and since there are no right or wrong answers, players are free to express their own opinions without having any prior knowledge of the topic. Players learn new information (written and checked by experts in the field), discuss the topic with other players, and can vote on the policy options they would recommend to decision-makers.

Democs has been adapted for schools with the help of the Centre for Science Education at Sheffield Hallam University. Because of the game-like format and informal way of learning it should motivate students to find out more on the topic after playing.

#### 4.3.15. Nanoday Munich – Video live conference

<b>Project</b>	Nanoday
<b>Date</b>	June 25 2012
<b>Location</b>	Deutsches Museum, Munich
<b>Innovative, beyond traditional</b>	Interactive video live conference to TUM Walter Schottky Institut
<b>Target group</b>	4 high school classes invited
<b>Format</b>	Real lab experiment
<b>Link for further information</b>	<a href="http://www.nanochannelsfp7.eu/?p=2782">http://www.nanochannelsfp7.eu/?p=2782</a>



The Nanoday in Deutsches Museum took place in the exhibition area for new technologies (close to the nano-exhibition), in an auditorium room with lectern and whiteboard/screen. The programme was planned for five hours. The visit of the exhibition and additional material, like videos provided by BridA were meant to be watched during breaks, also guided tours through exhibitions were organized.

Mainly, the event consisted of frontal lectures, introduction, powerpoint presentations, analogies and vision-videos. The event also integrated a live conference and a nano-show. The whole event offered opportunities for questions, but did not create a setting for dialogue, group works or discussions. Also, hands on activities were not conducted. The event also attracted other museum visitors than the invited school classes.

As good practice activity serves the **video live conference** with a laboratory at TUM, where two young male PHD students showed the creation of nanolamps. The live video conference allowed the visit to a lab of four classes at the same time and all information and explanation given was good to see and good to hear for everybody. A real working place was shown and the work on “real stuff” was demonstrated. Furthermore the setting offered the possibility for live-questions.

An additional interesting approach would have been the live streaming of the video conference via internet with possibilities for questions and comments included. In general it is recommended to enhance the audience also to ask personal questions to the scientists, such as how is a usual working day of a scientist. Another suggestion for improvement and to make an advantage of the live video stream would be to choose labs that are difficult to visit because of a long distance journey, not labs in the same city.

#### 4.3.16. Nanoshuttle

<b>Project</b>	Nanoshuttle
<b>Date</b>	Ongoing since 2007
<b>Location</b>	Bavaria, Germany
<b>Innovative, beyond traditional</b>	Multi-dimensional approach (presentation, hands on activities, career guidance); target group is picked up in their environment
<b>Target group</b>	Secondary school students
<b>Format</b>	Hands on activities
<b>Link for further information</b>	<a href="http://www.initiative-junge-forscher.de/jugendliche/schulbesuche.html">http://www.initiative-junge-forscher.de/jugendliche/schulbesuche.html</a>

The nanoshuttle is part of the “Initiative junge Forscherinnen und Forscher” and drives through Bavaria to visit secondary school classes for free. At the moment the focus is set on nanotechnologies, but should be extended on future technologies soon.

The visits as structured as follows: The shuttle drives to the school and the experts go directly into the classrooms. They set up microscopes to directly get an insight into the nano world and to provide the opportunities for students to experience experiments on their own. At the beginning there is a 45-minutes presentation. In the following 90 minutes students have the opportunity to try experiments and microscopies themselves. For the last 45 minutes of the visit



career orientation is offered to the students. The team of experts consists of PHD-students of the university Würzburg, all with a degree in natural sciences, mainly in Physics and Chemistry.

The main aim of the activity is to stimulate students to make self-experience. The experts set up all materials, objects and instruments for five to six experiments for the students, who then can pass through all stations on their own. There are descriptions provided for all experiments, but also direct supervision by the experts is offered, if necessary. Nevertheless the students are also motivated to bring in their own opinion and their own approach for solution and to further reflect on and deal with nanosciences.

Similar approaches can be found in the activities of Nanobus (Lithuania) and NanoTruck (Germany).

#### 4.3.17. FameLab

<b>Project</b>	FameLab
<b>Date</b>	Ongoing since 2005
<b>Location</b>	global
<b>Innovative, beyond traditional</b>	Innovative communication of science
<b>Target group</b>	General public
<b>Format</b>	Competition
<b>Link for further information</b>	<a href="http://www.famelab.org/">http://www.famelab.org/</a>

FameLab is a competition with the aim to find new voices of science and engineering. It started in 2005 in the UK by Cheltenham Science Festival and has now established across the world as a *“model for successfully identifying, training and mentoring scientists and engineers to share their enthusiasm for their subjects with the public”* (website).

Scientists present their fields of work and research projects in various innovative forms, e.g. sketches or poems and often use artifacts for their demonstrations. Aim is to explain their work within a restricted timeframe in an entertaining language that is understood by the audience. The audience is viewing the presentation while sitting around tables. After all presentations each table group ranks the performances. This means that all persons sitting around one table have to find a common decision and therefore get in interpersonal exchange. At results of all rankings the winner of the day is chosen.

FameLab sets out to support and encourage those working in science and engineering to use the skills they learn to communicate their work to society as a whole, not just colleagues and peers. It animates the audience also to judge and discuss afterwards about the performance as well as the topic presented. Furthermore the audience gets in touch with various fields of science that are not in their focus of daily life and have also the opportunity to directly get in dialogue with the scientists in the informal part after the presentations.



#### 4.4. Adoptions and recommendations for improvement

The template for the assessment of good practice cases included also a field for possible adoptions for improvement and recommendations. Adoptions for improvement were either found in the project descriptions and project evaluations as well as asked for in the interviews. Furthermore conclusions in general were drawn when assessing the activities. In the following the results are presented on one hand on general level and on the other hand on the level of the different formats described in 4.2.

In **general** the most important issue to be considered is still more interactivity. Although interactivity is a main element in all good practice activity it still has to be enforced. Interactivity needs time and if participants get a feeling to be in a rush, they get the impression that their opinion is not welcomed. In this regard also more integration of social media seems to be advisable. More attention should also be put on a bottom-up approach instead of working with top-down focused activities. Top-down activities are based on public understanding of science and inform people how science works. But it is important that the addressed audience can bring in their own experience with their own words and in their own way, although this is seen as a difficult approach when it comes to nanotechnology. Helpful in this regards could be a successful cooperation between universities and science centres (Interview Antonio Gomes da Costa).

There were still some problems stated when it comes to contact between experts and lay public, there seem to be some concerns on both sides and often dialogue does not work easily. Beside the commitment needed for both side for this kind of exchange, this also seems to be a way of learning to get in contact and in dialogue with each other. Stimulating debate between experts and audience has to be encouraged and experts should be carefully briefed in advance.

Although the general public is the most mentioned target group in the selected good practice activities, organisers and project leaders vote for further openness and further integration of other target groups and a deeper involvement of the general public. But this affords the adaptation of the concepts to come up with target group oriented activities.

The main difficulty when it comes to outreach is the low level of public knowledge on nanotechnology particularly, but also on physics and chemistry in general, which possibly leads to misconceptions in the communication process. Often general knowledge on physics and chemistry is required as precondition for understanding of and further participation in the activities.

Another general issue it the creation of further funding opportunities for outreach activity to be able to address and integrate more people.

With particular focus on **dialogue and discussion** activities is the animation to present science centres and science museums as places for public debate and dialogue , where the development of science should be supported, but not only acknowledged. Dialogue with various groups should be stimulated. Within the dialogue activities with experts more focus should be laid on personal exchange, e.g. on the working day of scientists, on their motivation for choosing their field of work etc. In general it is seen as important for dialogue and discussion activities,



particularly including workshops, to have a clear definition of the target group and of their level of knowledge (of nanotechnologies) and of their level of education. At the beginning of the event there should be an introduction round of participants to get a better understanding of the audience. At the end of the event there should be feedback opportunities for the audience. Furthermore it could be interesting to see and to compare what opinion people have before and after the discussion.

The recommendations for improvement concerning **hands-on activities** can be summarised in three points:

- Use of more hands-on activities, e.g. more exhibits
- More possibilities for feedback
- Enhanced integration of participants and target group in development of activities

**Web activities** and virtual tools are often missing a closer combination with “real life” activities. For example toolboxes could be combined with real trainings for the target group. Within virtual tools the possibilities for interaction could be enhanced, e.g. for giving feedback, for making comments and posts and for creating groups and networks.

Overall concepts of **art performances** are often seen as quite demanding and complex. To deepen the public engagement the following issues may be considered:

- Implementation of a more simplified methodology
- More social media integration in communication of event
- Integration of discussion games to better harvest the stimulating effect of arts
- Integration of activities enhancing the engagement of young people (e.g. games, contests)

In general art performances seem to long for a more focused and more integrated approach to be suitable in order to enhance the efficiency of the outreach activities.

Concerning **real lab experiments** there is the general suggestion to use more real live experiments to

- allow visitors to be part of immediate results
- show practical impact of experiments
- to embed the intended outcome





## 5. A Synopsis for effective outreach and Nanotechnology communication

Summarizing the most important findings of the screening described and the outcomes of the Nanochannels project (see Annex 7.5) we can derive the following guiding principles for the field of science/nanotechnology communication of NanOpinion. The principles describe how the communication with the different target groups should be shaped in order to allow successful communication activities for schools as well as for the general public in the project.

- **Early integration and involvement** of target groups in creation:

Target groups need to get integrated on a much earlier stage of the planning as well as during the phases of implementation and possibly also during the performance of outreach activities. Talking to the targeted audience from the beginning assures to tailor the respective activities exactly in line with the given needs and preferences.

- **Augmented and detailed profile** of target group

In order to perform an effective and successful outreach, a much more detailed profile of the targeted audience is necessary and the organiser have to know their target audience (Pearce, A., Romero, A. et al in Kahlor, L et al, 2010“ citing after Malsch, Grinbaum, Bontems, & Fruelund Anderson, 2012, p. 29f). This includes the (working) culture, language, location and (learning) preferences of each single target group. The project Nanochannels as well acknowledges this result and states that it is critical that one knows his audience.

- **Address issues and interests of target groups**

A key success factor for a successful outreach activity is to focus clearly on the issues and interests of each single target group (i.e. football players for Nanotechnology for fabrics, elderly in Nanotechnology in health...).

- **Organisation vs. integration**

Using already existing infrastructures that are exactly adapted to the identified target group help to perform a successful outreach activity. Instead of organizing a Nanotechnology day it seems to be more favourable to integrate the communication of nanotechnology e.g. in Coffee bars (Science café) or in different type of cabarets (Science Slam and Famelab).



- **Implementation of risk and benefit discussion**

A well-balanced information flow of both, risks and benefits, contributes significantly to the credibility of any dissemination action. In line with the Nanochannels projects' findings the implementation of both, benefits as well as risks of new technologies is an essential success factor for outreach activities.

- **Combination of different elements and formats** in an unusual way to reach different target groups

The combination of different elements and formats in unusual ways is important in order to reach all types and preferences of the different target groups. Especially with heterogeneous groups (like general public) it is crucial to vary formats and dissemination elements, using also unorthodox elements (i.e. games, theatre plays, but also changing location...). As the project Nanochannels concludes: different channels need to be employed in order to interact with different societal groups.

- **Formats that allow for step on – step off possibility**

Activities that do not require constant presence are preferred. Ideally dissemination activities allow the participant to step in and out any time, without losing any connection or information. Therefore the activities need to be designed in a very open way.

- But also **need for closed environments** for working on specific aims

At the same time it is important to offer also closed environments with an explicitly invited target group for learning, since some user groups preferred to work with a constant group of people in a restricted area for a longer time period.

- **Integration in local events or in events that are not scientific in their primary purpose**

Integrating outreach activities in local events or environments that are not scientific in their primary purpose ease the access to the different target groups. The concept is to use the already existing infrastructure and its visitors to access the target group. Obviously this requires high adaptation to the environment of the events.

- **Outreach in public space**

Still, public spaces are a highly effective platform for outreach that creates awareness of certain topics. It might transfer less in-depth knowledge of risks and benefits of nanotechnology, but it might initialize interest and awareness.



- **Creation of alternative space and neutral spaces - spaces of opportunity**

The analysis of the different successful activities has shown that the creations of spaces that are alternative and neutral are highly valuable for participants since they foster exchange and discussion. These neutral or alternative spaces are areas where ideas and new concepts are created, different activities started or simply serve as space for exchange and communication.

- **No shyness concerning attractive and engaging formats**

There should be made a distinction between interesting events and attractive events. For many people Nanotechnology is not an interesting field, so ways have to be found how to attract people, even if they are not interested (Kitsinelis, 2012, p. 7-9). Innovative concepts for communicating science following the guiding principle of 'being brave'. Attractive and engaging formats are necessary in order to convert a – possibly rather complex - topic into some topic that is highly interesting to people. The anxiety of losing credibility has to be eliminated to open the possibility for new innovative and engaging formats.

- **Opportunities for self-experience**

Innovative and engaging formats also offer opportunities for self-experiences for users. Self-experience activities do not only foster the learning and the engagement but it is also an innovative way of getting the interest of the target group. Self-experience examples that were screened as highly successful are hands-on experiments, art performances, theatres, a.s.o.

- **New media for the involvement of certain target groups** (e.g. mini courses)

For complementing a successful outreach activity, it is crucial to involve also new media (web2.0 tools) by different formats (social networks that share contacts as well as material and information).

- **Competition with prizes**

Competitions are an effective way of stimulating participation. They need to be well designed, implemented and operated. The format and conditions of participation need to be very clear to the target group. Prizes that are in connection with the topic are to be preferred (nanotechnology products for NanOpinion).



- **Providing insight in scientific world**

Increasingly, projects are recognizing that encouraging interest in science goes hand in hand with opening the scientific world to the public. By doing so, the 'abstract' science is getting more realistic to people. Scientists need to offer activities aiming at putting the spotlight on science and showing people how engaging it can be (e.g. live experiments, science slam...).

- **Create connection to real life**

The connection to items that are affecting real life is a key element for successful outreach activities. As the project Nanochannels is also stating: *“Anchoring nanotechnology to a product that has relevance to the individual is critical to raise motivation for engagement, i.e. a general discussion on nanotechnology does not work as well as, for example, discussion on food products, or sports equipment, or novel medicines.”* This finding goes exactly in line with our analysis.

- **Perspectives of different practitioners are important to the wider public, in order for the non-expert to make up their minds**

According to the Nanochannels project, the involvement of different practitioners is important to the wider public, since they raise issues that had not occurred to the other participants. What the screening of the different project has shown is the fact that different stakeholders indeed raise the quality and credibility of dissemination activities. Therefore it is advised to organize different formats where a heterogeneous group of stakeholder can get involved.

- **Personal interactions remain the best way of engaging with the wider public**

The project Nanochannels concludes that the best way of engaging with the wider public is personal interactions. Within the screening of different projects, articles and interviews we have come to the same conclusion with the addition that this personal interaction requires high amount of effort and engagement.



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## 7. Annexes

### 7.1. Assessment Template

#### Assessment of activity

<b>Name</b> NT has to be explicitly mentioned	
<b>Date</b> Period: approx. not older than 6 years	
<b>Location</b> (in Europe)	
<b>Primary source of description available</b> personal observation, interview...	
<b>Innovative, beyond traditional</b> (at least parts of activity)	
<b>Target group</b> (addressed, attended)	
<b>Further information (URL, contact...)</b>	

Checklist:

(check, partly, no)

<input type="checkbox"/> Aim: Outreach and communication of NT	
<input type="checkbox"/> There has to be something done, performed, carried out. There has to be an action.	
<input type="checkbox"/> It should enable at least the possibility for interaction	
<input type="checkbox"/> Beyond traditional science communication activities	
<input type="checkbox"/> It can be face to face and live, but not necessarily	
<input type="checkbox"/> There has to be an audience	
<input type="checkbox"/> Any organizer (not necessarily the science community)	

#### Description of the activity

(in general, setting, format, elements...)



**Best practice example, description, explanation:**  
(the activity that meets the assessment criteria)

**Possible adoptions for improvement:**  
(according to feedback, observations...)

**Recommendations:**  
For future communication activities (derived of this activity)

**Conclusio**  
To be generalized to science communication activities (derived of this activity)



## 7.2. Interview Guideline

### Interview Guideline

Interviewer			
Interviewee			
Function	<b>Could you please introduce yourself, your background, your actual position and your experience in science communication</b>		
City		Country	
Date		Time	

*Intro: We are looking for innovative best practise examples from the present point of view, not what has been seen as being innovative, but what can be still recommended or adopted for todays needs.*

No	Research Question	Question	Subquestions	Comments
Q 1		<b>Intro: Interviewer: Provide definition on outreach characteristics</b>	<b>Definition, characteristics of the activity</b> <ul style="list-style-type: none"> <li>○ Aim: Outreach and communication of NT</li> <li>○ There has to be something done, performed, carried out. There has to be an action.</li> <li>○ It should enable at least the possibility for interaction</li> <li>○ Beyond traditional science communication activities</li> <li>○ It can be face to face and live, but not necessarily</li> <li>○ There has to be an audience</li> <li>○ Any organizer (not necessarily the science community)</li> </ul>	<b><i>Interviewer, please also consider Knock-out criteria:<sup>1</sup></i></b> <ul style="list-style-type: none"> <li>○ <i>No tools and games alone (should be embedded in interactive activity)</i></li> <li>○ <i>No lecture/presentation</i></li> <li>○ <i>No paper</i></li> <li>○ <i>No school lessons</i></li> <li>○ <i>No opinion polls</i></li> <li>○ <i>No questionnaires</i></li> </ul>

- <sup>1</sup> Knock-out criteria: We can also focus **on parts of activities** if they are in line with the criteria. If activities (like games) are embedded in an innovative approach, they could be considered as well



			○ Activities in Europe	○ No exhibition in general
<b>Q 2</b>	<b>Basic information on the outreach activity</b>	According to this definition, have you experienced such activities, at least partly? Which?	<b>Interviewer, ask for details, concerning:</b> Name of activity, date Location (e.g. city, room) Participants, audience (number, gender, age, etc.) Basic format of activities (e.g. live experiment etc.) Supporting institutions, cooperation External invited special guests, experts etc.	<i>Specify one activity, which is in line with the definition The following interview should focus on this activity!!</i>
<b>Q 3</b>	<b>Intention, target group</b>	What was the main intention of the activity, which target group(s) should be addressed and why?	<b>Interviewer, ask details about</b> Impulse (why did you create the idea?) Initiator (sponsor) (who asked you to make the activity?) Organiser (the interviewee himself?) Specificities of the target group addressed	<i>Find out the motivation and intention of the activity</i>
<b>Q 4</b>	<b>How and what</b>	Please describe the activity in more detail	<b>Interviewer, ask for details, concerning:</b> core elements (e.g. dance, performance, games + materials used) Which information/introduction was given? Intended level of interactivity, involvement of participants	<i>Find out ways of communication and outreach activity, level of interactivity</i>
<b>Q 5</b>	<b>Assessment of the activity</b>	What were reactions on the activity?	<b>Interviewer, ask for details, concerning:</b> Which Requests and questions came up from the audience? Involvement and interest of participants and audience (from apathy to enthusiasm) Which topics were brought in by participants? How appealing was the activity? Was the activity target group oriented/tailored? (how convincing was the target group addressed)	<i>Find out estimations on success of the activity as a best practise example Collect factors on strengths and weaknesses, recommendations and no goes in general. Recommendations → conclusions!</i>
Q 6		What is your main assessment of the activity?	From your point of view, how would you assess the activity in general (in terms of audience, involvement, reactions)?	
Q 7		What were the main factors or criteria of influence?	What contributed to success, what were hindering factors, barriers, difficulties, supporting issues?	



Q 8		About which further outreach activities do you know that could be seen as best practise examples?	<b>Interviewer, ask for details:</b> URLs, dates, accompanying documents	<i>Find out about more best practise examples to be communicated to the team and added to the list (snowball effect)</i>
Q 9		For you personally: What was the most memorable science communication activity?	Was it the best, the worst? And why?	<i>Find out more success factors or no goes,</i>

Thank you for the interview!



### 7.3. Observation template

#### Observation template

<b>Name of activity</b>	
<b>Name of host</b>	
<b>City</b>	
<b>Country</b>	
<b>Date</b>	
<b>Time</b>	
<b>Documentation available/links/podcasts/livestreams</b>	

#### Visit of activities

<b>Question</b>	<b>Subquestions</b>	<b>Description (to be filled in)</b>	<b>Research question</b>
<b>Basic information</b>	Timeframe		
	Location (e.g. room)		





	Participants, audience (number, gender, age, etc.)		
	Basic format of activities (e.g. live experiment etc.)		
	Supporting institutions, cooperation		
	External invited special guests, experts etc.		
<b>How and what</b>	core elements (e.g. dance, performance, games + materials used)		<i>Assessment of ways of communication and outreach activity, interactivity</i>
	Which information/introduction was given?		



	Intended level of interactivity, involvement of participants		
<b>Reactions</b>	Requests and questions		<i>How appealing? Target group oriented/tailored? (how convincing is the target group addressed)</i>
	Involvement and interest of participants and audience (from apathy to enthusiasm)		
	Which topics are brought in by participants?		
<b>Reflection (if applicable)</b>	Of participants		<i>Assessment of ways of communication and outreach activity, interactivity How appealing? Target group oriented/tailored? (how convincing is the target group addressed)</i>
	Of organisers		



## 7.4. Google doc

### 7.4.1. Projects

project	short description	URL or content details	date	
Framing Nano	The final outcome of the project will be a proposal for a Governance Plan highlighting the needs, actions and recommendations necessary to develop safe nanotechnology at EU level and beyond. Workshops/Consensus conference	<a href="http://www.framingnano.eu/">http://www.framingnano.eu/</a>	2010	-
MACOSPOL	Mapping Controversies on Sciences for Politics. Internet based visualisation of risk related controversies as argumentation maps on the basis of two exemplary case studies: dietary supplements and nanoscale particles.	<a href="http://www.macospol.com/">http://www.macospol.com/</a> --- does not work anymore! <a href="http://riskcart1.wzu.uni-augsburg.de/index.php?Lang=GERMAN&amp;PHPSESSID=1073d853cf58a239b0ef6943b1c8bcd0&amp;Lang=ENGLISH">http://riskcart1.wzu.uni-augsburg.de/index.php?Lang=GERMAN&amp;PHPSESSID=1073d853cf58a239b0ef6943b1c8bcd0&amp;Lang=ENGLISH</a>	2009-	+
Nano and Me	A project of the responsible nano forum; aim with nano&me is to provide balanced information about nanotechnologies and be the hub of debate for everyone to discuss the important issues which arise from its useable nano forum,	<a href="http://www.nanoandme.org/">http://www.nanoandme.org/</a>		-
NanoCap	"Nanotechnology Capacity Building NGOs" - NanoCap was set up to deepen the understanding of environmental, occupational health and safety risks and ethical aspects of nanotechnology. Therefore a structured discussion was organised between environmental NGOs, trade unions, academic researchers and other stakeholders.	<a href="http://www.nanocap.eu">http://www.nanocap.eu</a>	2006-2009	+
NanoDialogue	The "pillars" of Nanodialogue are a modular exhibition, designed for display in 8 different countries, a program of events and participatory activities in each location, and a survey of public perceptions and expectations with 800 questionnaires and a multimedia polling station at each location.	<a href="http://tinyurl.com/6yjjw7h">http://tinyurl.com/6yjjw7h</a>		-
NanoForum	The analysis of these components has led to a final	<a href="http://www.nanoforum.org/">http://www.nanoforum.org/</a>		-



	conference, held in the seat of the European Parliament in Brussels, in order to present the results of the project to the European Commission and Parliament.			
NanoJury	NanoJury was the first citizens jury on nanotechnology in Europe. It brought together 15 randomly chosen people from different backgrounds in a particular region of the UK, to hear evidence about nanotechnologies and the roles they might play in a range of possible futures.	<a href="http://www.nanojury.org.uk/">http://www.nanojury.org.uk/</a> ; <a href="http://www.google.at/url?sa=t&amp;rct=j&amp;q=nanojury&amp;source=web&amp;cd=3&amp;ved=0CFoQFjAC&amp;url=http%3A%2F%2Fwww.frontiers-eu.org%2FJPA%2Fethics%2FWP8%2520NanoJury%2520-%2520report.pdf&amp;ei=UKgbUJaaL4XGswalmIGYCA&amp;usg=AFQjCNHxclFTnfwJrE6Pd-4XvKvnxPI9Tg&amp;cad=rja">http://www.google.at/url?sa=t&amp;rct=j&amp;q=nanojury&amp;source=web&amp;cd=3&amp;ved=0CFoQFjAC&amp;url=http%3A%2F%2Fwww.frontiers-eu.org%2FJPA%2Fethics%2FWP8%2520NanoJury%2520-%2520report.pdf&amp;ei=UKgbUJaaL4XGswalmIGYCA&amp;usg=AFQjCNHxclFTnfwJrE6Pd-4XvKvnxPI9Tg&amp;cad=rja</a>	2005	-
Nanologue	facilitate dialogue between researcher, business and the civil society about the potential of NT applications. Based on an intensive dialogue and dissemination process, Nanologue facilitates the translation of civil society's ELSA requirements on NT research into a real competitive advantage for the European industry. Methods: public consultation, stakeholder dialogues. Results: variety of documents Nanologue's overarching goal was to facilitate dialogue between researcher, business and the civil society about the potential of nanoscience and nanotechnology (NT) applications to improve the quality of life, create wealth, and to assess the technologies' potential societal impacts.	<a href="http://tinyurl.com/6jmo63k">http://tinyurl.com/6jmo63k</a> ; and: Informing, involving or engaging? Science communication, in the ages of atom-, bio- and nanotechnology, IN Public Understanding of Science/ Volume 18, 2009, interview Paul Hix, brochure; <a href="http://www.nanologue.net">www.nanologue.net</a>	2005-2006	+
NanoPlat	develop a platform for deliberative processes on Nano-science and Nano-technology (NS&T) in the European consumer market.	<a href="http://www.nanoplat.org/">http://www.nanoplat.org/</a>		-
NanoSciEra	The NanoSci-ERA Consortium is a network of public or private bodies responsible for financing or managing research programmes in nanoscience that are established in countries belonging to the European Research Area (ERA).	<a href="http://www.nanoscience-europe.org">http://www.nanoscience-europe.org</a>	2006	-



NanoToTouch	Open Nano Lab and Nano Researcher Live in science museums	<a href="http://www.nanototouch.eu/">http://www.nanototouch.eu/</a>		+
NanoTruck	moving exhibition across Germany	<a href="http://www.nanotruck.de/en/">http://www.nanotruck.de/en/</a>	ongoing	+
NanoTV	Nano-technology Videos	<a href="http://www.youris.com/Nano/NANO-TV">http://www.youris.com/Nano/NANO-TV</a>		-
NanoYou		<a href="http://nanoyou.eu/">http://nanoyou.eu/</a>		-
Path	participatory Approaches in Science and Technology; to form a network of interested parties concerned with the involvement of society in the deliberation of science-based policy issues.	<a href="http://www.macaulay.ac.uk/socioeconomics/research/path/index.html">http://www.macaulay.ac.uk/socioeconomics/research/path/index.html</a>	2004-2006; some activities are still ongoing in 2012; for the moment no Nanotechnology	-
SwissNanoCube	Swiss Nano-Cube is the national knowledge and education platform for micro and nanotechnology. It addresses teachers and students from vocational schools, secondary schools as well as higher professional schools.	<a href="http://www.innovationsgesellschaft.ch/index.php?page=519">http://www.innovationsgesellschaft.ch/index.php?page=519</a>		+
Time for Nano	Nano Project aims at engaging the general public, with a special attention to young people, on benefits and risks related to nanoscale research, engineering and technology, through specific informal education products.	<a href="http://www.timefornano.eu/">http://www.timefornano.eu/</a>	ongoing	+
Observatory Nano	provision of wide-ranging scientific and economic analysis of nanoscience and nanotechnology developments	<a href="http://www.observatorynano.eu/">www.observatorynano.eu/</a>	unknown	-
Nanofutures	initiative for sustainable development by Nanotechnologies	<a href="http://www.nanofutures.eu/">http://www.nanofutures.eu/</a>		-
Deepen	for integrated understanding of the ethical challenges posed by emerging nanotechnologies in real world circumstances, and their implications for civil society, for governance, and for scientific practice.	<a href="http://www.geography.dur.ac.uk/projects/deepen/Home/tabid/1871/Default.aspx">http://www.geography.dur.ac.uk/projects/deepen/Home/tabid/1871/Default.aspx</a>		-
Riskbridge	Building robust, integrative inter-disciplinary governance models for emerging and existing risks	<a href="https://sites.google.com/site/euriskbridgeproject/">https://sites.google.com/site/euriskbridgeproject/</a>	1 July 2006 – 30 June 2009	-
Nanocode	Implementing the European Commission Code of Conduct for Responsible Nanotechnologies	<a href="http://www.nanocode.eu">http://www.nanocode.eu</a>	end in Spring 2012	-
iNTegRisk	Early Recognition, Monitoring and Integrated Management of Emerging, New Technology related	<a href="http://www.integrisk.eu-vri.eu/">http://www.integrisk.eu-vri.eu/</a>	ongoing	-



	Risks			
MIDIR	risk governance	<a href="http://www.midir.eu/">http://www.midir.eu/</a>	FP6	-
CIPAST	How to design a participatory process for a consortium of science centres and science museums (based in several European countries) on an emerging issue at the European level.	<a href="http://www.cipast.org/download/CD%20CIPAST%20in%20Practice/cipast/en/practice_3_2_5.htm">http://www.cipast.org/download/CD%20CIPAST%20in%20Practice/cipast/en/practice_3_2_5.htm</a> <a href="http://www.cipast.org/download/CIPAST%20Newsletter%20Nano.pdf">http://www.cipast.org/download/CIPAST%20Newsletter%20Nano.pdf</a>	2005-2007	+
MEETING OF MINDS				-
FUND/DECIDE	PlayDecide is a discussion game to talk in a simple and effective way about controversial issues.	<a href="http://www.playdecide.eu/">http://www.playdecide.eu/</a>	FP7	+
OECD WORKING PARTY ON NANO	to advise upon emerging policy issues of science, technology and innovation related to the responsible development of nanotechnology.	<a href="http://www.oecd.org/sti/nano">www.oecd.org/sti/nano</a>	since 2007	-
NANOSMILE	explaining risks of NT to public	<a href="http://www.nanosmile.org/">http://www.nanosmile.org/</a>	2008	-
NANOIMPACTNET (IMPACTNET?)	network on the health and environmental impact of nanomaterials	<a href="http://www.nanoimpactnet.eu/">http://www.nanoimpactnet.eu/</a>	2004-2012	+
ENREHS	not found			-
INLIVETOX	Development and evaluation of a novel tool for physiologically accurate data generation	<a href="http://www.inlivetox.eu/">http://www.inlivetox.eu/</a>	May 2009-April 2012	-
NANOINTERACT		<a href="http://www.nanointeract.net">http://www.nanointeract.net</a>	2007-2009	-
NANOSAFE2	Safe production and use of nanomaterials	<a href="http://www.nanosafe.org/">http://www.nanosafe.org/</a>	2005-2009; every 2nd year conference	-
CELLNANO TOX	research project CellNanoTox aims at the development of innovative multidisciplinary sets of tests and indicators for toxicological profiling of nanoparticles (NPs) as well as at unravelling the correlation between the physicochemical characteristics of NPs and their toxic potential on various organs of the human body.	<a href="http://www.fp6-cellnanotox.net/">http://www.fp6-cellnanotox.net/</a>		-





DIPNA	Development of an Integrated Platform for Nanoparticle Analysis to verify their possible toxicity and the eco-toxicity	forbitten URL: www.dipna.eu		-
ENSSAROX	No entry found	No entry found		-
HINAMOX	European project that tests the toxicity of metal oxide nanoparticles	<a href="http://www.hinamox.eu/">http://www.hinamox.eu/</a>	2009 - still ongoing	-
NANORETOX	aim is to identify the potential risks to the environment and human health posed by free engineered (i.e. manmade) nanomaterials	<a href="http://www.nanorettox.eu/">http://www.nanorettox.eu/</a>	2010	-
NEPHH	Nanomaterials Related Environmental Pollution and Health Hazards Throughout their Life Cycle	<a href="http://www.nephh-fp7.eu/">http://www.nephh-fp7.eu/</a>	March 2012	-
NEURONANO	scientific multi-disciplinary project to develop neuronal nano-engineering by integrating Neuroscience with Materials Science, Nano and Microtechnology.	<a href="http://www.neuronano.net/">http://www.neuronano.net/</a>	FP 6	-
ENRHES	Engineered Nanoparticles: Review of Health and Environmental Safety	project website has been discontinued; <a href="http://ihcp.jrc.ec.europa.eu/whats-new/enhres-final-report/">http://ihcp.jrc.ec.europa.eu/whats-new/enhres-final-report/</a>	August 2009	-
NANOSH	Inflammatory and genotoxic effects of engineered nanomaterial	<a href="http://www.ttl.fi/partner/nanosh/sivut/default.aspx">http://www.ttl.fi/partner/nanosh/sivut/default.aspx</a>	till 2009	-
NANOFATE	investigates the fate and effects of engineered nanoparticles	<a href="http://www.nanofate.eu">http://www.nanofate.eu</a>	April 2012	-
NANOMEDROUNDTABLE	The Nanomed Round Table's main purpose is to provide to European stakeholders a set of recommendations to support decision making regarding nanomedical innovations. These recommendations will be based on a thorough analysis of existing documents, multi-stakeholder debate, and construction of scenarios on the possible consequences and impacts of nanomedicine.	<a href="http://www.nanomedroundtable.org/">http://www.nanomedroundtable.org/</a>		-
NANOBIORAISE	combines ethics research in nanobiotechnology with science communication	<a href="http://nanobio-raise.org/">http://nanobio-raise.org/</a> website down on 9.10.2012		-
CONTECS	potential roles that the social sciences and humanities (SSH) can play with regard to phenomenon of technological convergence	<a href="http://www.contecs.fraunhofer.de/">http://www.contecs.fraunhofer.de/</a>	FP 6	-
WOMEN IN	community provides a gathering to support the	<a href="http://nanosociety.us/programs/n">http://nanosociety.us/programs/n</a>	2012	-



NANO	presence of women in the nano world	ano-women.html		
MESSENGER	media, science & society - engagement & governance in Europe; provides guidelines for researchers on how to communicate with media	<a href="http://www.messenger-europe.org/">http://www.messenger-europe.org/</a> and <a href="http://www.sirc.org/messenger/">http://www.sirc.org/messenger/</a>	FP 6	-
NANO ROAD SME		<a href="http://www.nanoroad.net/">http://www.nanoroad.net/</a>		-
PRIME	NoE; training	<a href="http://www.prime-noe.org/">http://www.prime-noe.org/</a>		-
ETHICSCHOOL	fostering discourse on technology and innovation	<a href="http://www.ethicschool.nl/">http://www.ethicschool.nl/</a>		+
PATH	see entry 16			-
RISKBRIDGE	governance models for emerging and existing risks	<a href="https://sites.google.com/site/euriskbridgeproject/home">https://sites.google.com/site/euriskbridgeproject/home</a>	FP 6	-
EUROINDIANET	connection India/Europe	<a href="http://www2.spi.pt/euroindianet/">http://www2.spi.pt/euroindianet/</a>		-
KNOWLEDGE NBIC	researchers, policy-makers and activists concerned about the political, social and ethical implications of emerging technologies	<a href="http://www.converging-technologies.org/converging-technologies.html">http://www.converging-technologies.org/converging-technologies.html</a>	FP 6	-
RESPONSIBLE NANOFORUM		see entry 68!!		
NANO2MARKET	Best practices for IPR and Technology Transfer in Nanotechnology Developments	<a href="http://www.nano2market.eu/">http://www.nano2market.eu/</a>	FP 7	+
FRONTIERS	aims at establishing leadership in research and innovation on behalf of life sciences related nanotechnology.	<a href="http://www.frontiers-eu.org/">http://www.frontiers-eu.org/</a>	FP 6	-
NANOSCI-E+	to interface biological nanopores with solid-state devices to develop a novel method of force spectroscopy on the single molecule level.	<a href="http://www.thenanoporesite.com/nanosci-e.html">http://www.thenanoporesite.com/nanosci-e.html</a>	2011	-
CO-NANOMET	activities addressing the need to develop the required measurement frame to successfully support the development and economic exploitation of nanotechnology.	<a href="http://www.co-nanomet.eu/">http://www.co-nanomet.eu/</a>	FP7	+
SANDIE	NoE research and knowledge in the field of Self-Assembled semiconductor Nanostructures	<a href="http://www.sandie.org/">http://www.sandie.org/</a>		-
NANO-STRAND	Standardization related to Research and Development for Nanotechnologies	<a href="http://www.ebn.din.de/cmd?level=tpl-">http://www.ebn.din.de/cmd?level=tpl-</a>	till 2008	-



		rubrik&menuid=52979&cmsareaid=52979&menurubricid=53045&cmsrubid=53045		
NANO-QUANTA	Nanoscale Quantum Simulations for Nanostructures and Advanced Materials	<a href="http://www.nanowerk.com/nanotechnology-labs.php?url2=Nanoquanta_Network_of_Excellence.php">http://www.nanowerk.com/nanotechnology-labs.php?url2=Nanoquanta_Network_of_Excellence.php</a>		-
EURONANO BIO	building a nanobiotechnology capacity in Europe	<a href="http://www.euronanobio.eu/">http://www.euronanobio.eu/</a>	FP 7	-
NANOCODE	Implementing the European Commission Code of Conduct for Responsible Nanotechnologies	<a href="http://www.nanocode.eu/">http://www.nanocode.eu/</a>	FP 7	-
DEMOCS	a conversation card activity for teaching science and citizenship	<a href="http://www.scienceinschool.org/2007/issue4/democs">http://www.scienceinschool.org/2007/issue4/democs</a>	2007	+
RESPONSIBLE NANO FORUM		website not available <a href="http://www.responsiblenanoforum.org">www.responsiblenanoforum.org</a>		-
Nanochannels	The Nanochannels project is a unique public experiment of democratic dialogue in action about the new industrial revolution that could change the face of medicine, energy production and water purification, electronics, materials and security.	<a href="http://www.nanochannelsfp7.eu/">http://www.nanochannelsfp7.eu/</a>	till 2012	+
Nano4 Women	nanotechnology for females; 3 different activities: competition, entrepreneurship, orientation on science of nanotechnology	<a href="http://www.nano4women.com/">http://www.nano4women.com/</a>		+
NANOSCIETY	in connection with nanopodium	<a href="http://www.nanosociety.nl/public/">http://www.nanosociety.nl/public/</a>	2012	see Nanopodium
Nanopodium	different activities to promote discourse on nanotechnology	<a href="http://www.nanopodium.nl/">http://www.nanopodium.nl/</a>		+
nanoWeek	event dedicated to nanotechnology with events, conferences, meetings and an exhibition that aims to explain what is nanotechnology, illustrating the different applications and fields of use. target group: - entrepreneurs - Personal, corporate / R & D employees - Representatives of the PA - journalists	<a href="http://www.nanoweek.it/files/index.cfm?id_rst=312">http://www.nanoweek.it/files/index.cfm?id_rst=312</a>	2007	+



	<ul style="list-style-type: none"> <li>- Students and researchers</li> <li>- Academic</li> <li>- High school teachers</li> <li>- citizens</li> </ul>			
Scienza Attiva	<p>dissemination of scientific culture across all the disciplines devoted to secondary school level II, aim of making students more aware of current issues of scientific-technological issues, The themes of the third edition (AS 2011-2012) are:</p> <ul style="list-style-type: none"> <li>- Nanosciences;</li> <li>- Stem cells.</li> </ul>	<a href="http://www.scienzattiva.eu/pagine/progetto">http://www.scienzattiva.eu/pagine/progetto</a>	Nov 2011 - April 2012	+
NanoShow	The aim is that pupils should learn something and go away with increased knowledge - This is achieved by experienced student facilitators, powerpoint presentations, several demonstration trials in all shows where students with their own eyes can see what happens and how.	<a href="http://nanoshow.dk/">http://nanoshow.dk/</a>	ongoing?	+
PEN	Project on Emerging Nanotechnologies	<a href="http://nanotechproject.org">http://nanotechproject.org</a>	since 2005	+
SciDev.Net	SciDev.Net's nanotechnology quick guide provides a concise introduction to nanotechnology and its relevance to development as well resources on nanotechnology news, features, opinions and consultations and a gateway to nanotechnology definitions, events, key documents and links.	<a href="http://www.scidev.net">http://www.scidev.net</a>		-
Small Talk	<p>Small Talk is a collaboration exploring the aspirations and concerns of scientists and the public about nanotechnologies, as well as sharing these views with policymakers.</p> <p>Small Talk was a three-year long collaborative project, funded through a Copus grant of £49,900, with additional support provided 'in kind' by partner organisations. The project looked at the benefits for the science communication community in working together on dialogue activities for an 'upstream' issue —</p>	<a href="http://www.smalltalk.org.uk">http://www.smalltalk.org.uk</a>		+



	nanotechnology.			
informal commons	guide to informal education resources on the web	<a href="http://informalcommons.org/">http://informalcommons.org/</a>	ongoing	-
NanoForum	European Nanotechnology Gateway	<a href="http://www.nanoforum.org/">http://www.nanoforum.org/</a>	ongoing	-
NISENET Nanoscale Informal Science Education Network	The Nanoscale Informal Science Education Network (NISE Net) is a national community of researchers and informal science educators dedicated to fostering public awareness, engagement, and understanding of nanoscale science, engineering, and technology.	<a href="http://www.nisenet.org/project/index.html">http://www.nisenet.org/project/index.html</a> , <a href="http://www.nisenet.org/">http://www.nisenet.org/</a>	ongoing	+
				-
Welcome Trust Big Picture on Nanoscience	Published twice a year, 'Big Picture' is a free post-16 resource for teachers that explores issues around biology and medicine. It is produced both in a printed hardcopy form and in an online version that includes supplementary information. One of the issues of 'Big Picture' focuses on nanotechnology, from the concepts to the societal implications surrounding the applications.	<a href="http://www.wellcome.ac.uk/Education-resources/Teaching-and-education/Big-Picture/All-issues/Nanoscience/index.htm">http://www.wellcome.ac.uk/Education-resources/Teaching-and-education/Big-Picture/All-issues/Nanoscience/index.htm</a>	June 2005	-
	To contribute to the development of public awareness on European nano research in all European countries through television media (in the form of video news releases) and the internet series, showing the most recent and exciting discoveries in the area of nanotechnology research, released by youris.com in 2010 and early 2011.			
Nano-TV		<a href="http://www.youris.com/Nano/NANO-TV">http://www.youris.com/Nano/NANO-TV</a>	01.2009-06.2010	-
Nanoart21	Art-science-technology. Web: on-line exhibitions of nanoart, blogs, festivals of nanoart	<a href="http://www.nanoart21.org">http://www.nanoart21.org</a>	ongoing	+
Guldjakten - The hunt for gold	A contest for Swedish pupils organized by Nobel Museum, Uppsala University and Foundation for Strategic Research - together with scientists at Uppsala University the pupils are supposed to look for new nanoparticles. It includes presentations and seminars.	<a href="http://www.nobelmuseum.se/sv/for-skarhjalpen">http://www.nobelmuseum.se/sv/for-skarhjalpen</a> <a href="https://www.facebook.com/groups/347631801926751/">https://www.facebook.com/groups/347631801926751/</a>	March 2012 - December 2012	+
Nano Connect Scandinavia	Nano Connect Scandinavia is a network created by seven Universities and	<a href="http://www.nano-connect.org/">http://www.nano-connect.org/</a>	2009-2012	+



	institutes in south-western Scandinavia. Financed by EU/Interreg IV A, partner universities and public regional bodies. Includes workshops on public issues related to NT.			
NanoSphere	Project of University of Gothenburg and Chalmers University of Technology, Gothenburg. Funded by Swedish Research Council Formas. Focus on nano-risk research (environment, health).	<a href="http://www.nanosphere.gu.se/">http://www.nanosphere.gu.se/</a>	2010-2014	-
Nanoscope 2009, 2010	nanotechnology through visual (painting, sculpture, architecture, design, audiovisuals and web games) and expressive arts (dance, music). Started as outreach activity accompanying ENF 2009. Following ENF 2009 developed into independent long term art&sci project hosted by the Faculty of Chemical technology of University of Pardubice .Communication	<a href="http://www.utesla.cz/nanoskop-program-cz.html">http://www.utesla.cz/nanoskop-program-cz.html</a> <a href="http://utesla.cz/content/wp-content/uploads/nanoscope-leaflet-eng1.pdf">http://utesla.cz/content/wp-content/uploads/nanoscope-leaflet-eng1.pdf</a>	01.2009 - 12.2010	+
ISWA	Experimental project on science communication through the Arts. Main activities: Several events focusing nanotechnology were performed: - exhibitions Nanoscope Redux, NanoPOLIS- shows Night in Nanopolis at New Stage of the Czech National Theatre, NanoPOLIS @TUWien fusing live nanoscience lectures and experiments with dance, music and visual art- art film - 7 stories, one episode about nanotechnology - public workshops and seminars (including Pecha-Kucha) with nanoscientists at the University of Pardubice	<a href="http://www.iswaproject.eu">www.iswaproject.eu</a> <a href="http://www.utesla.cz/content/wp-content/uploads/ISWA_UTESLA-Booklet_32_FIN5.pdf">www.utesla.cz/content/wp-content/uploads/ISWA_UTESLA-Booklet_32_FIN5.pdf</a>	FP7 03.2011 - still ongoing	+
MUNRO	CZ project from SF (OP Education for competitiveness) - Goal: development of science communication skills performing pilot project on Nanotechnology focusing secondary school students. Primary target group: scientist	<a href="http://www.munro.cz">www.munro.cz</a> <a href="http://sympoziumsychrov.cz/wp-content/uploads/2012/06/1-Rydvalova_Sychrov_MUNRO_2012-nove.pdf">http://sympoziumsychrov.cz/wp-content/uploads/2012/06/1-Rydvalova_Sychrov_MUNRO_2012-nove.pdf</a>	2009-06.2012	-
NANOSYSTEMS, NANOTEAM, IVEFEN, NANO-VŠB-TUO	CZ projects mainly from SF (OP Education for competitiveness) - Goal: specialised training in the area of nanosystems and nanotechnologies. Primary targeted group: R&D personel Secondary target group: secondary school students	<a href="http://nanosystemy.upol.cz/">http://nanosystemy.upol.cz/</a> <a href="http://www.umel.feec.vutbr.cz/nanoteam/01.php">http://www.umel.feec.vutbr.cz/nanoteam/01.php</a> <a href="http://nanotechnologie.vsb.cz/">http://nanotechnologie.vsb.cz/</a>	2009-2012	-



Nanotechnology in practical application	CZ project from OP Education for competitiveness - Goal: specialized training in the development of market application of nano including communication. Primary target group: SME management personnel	<a href="http://www.nanoklastr.cz/inpage/projekty/">http://www.nanoklastr.cz/inpage/projekty/</a>		-
Dialogue and society/nanotechnology	Website operated by Swiss Federal Office of Public Health. It offers a selection of reports and studies focused on dialogue around nanotechnology.	<a href="http://www.bag.admin.ch/nanotechnologie/12197/index.html?lang=en">http://www.bag.admin.ch/nanotechnologie/12197/index.html?lang=en</a>	ongoing	-
i-nett BASEL nanu, Arbeitsgruppe NanoDialog	Nano-network (a part of i-net Basel) supported by Swiss regions Aargau, Basel and Jura. Organizing public NanoEvents and maintaining Innovation Circles comprising various nano-actors including consumers	<a href="http://www.inet-innovation.ch/netzwerk/nanotech.html?L=1">http://www.inet-innovation.ch/netzwerk/nanotech.html?L=1</a> , <a href="http://www.wwf-bs.ch/nano.pdf">http://www.wwf-bs.ch/nano.pdf</a>	2009-2011	+
Nanodialogues	Experiments in public engagement with science			+
Nanotechnology Engagement Group	The NEG was established in 2005 to document the learning from a series of groundbreaking attempts to involve members of the public in discussions about the development and governance of nanotechnologies. The NEG studied six UK projects that sought to engage members of the public in dialogue about nanotechnologies.		ended 2007	-
Nanotechnology Issues Dialogue Group	The Nanotechnology Issues Dialogue Group (NIDG), chaired by Go – Science, is enabling the responsible development of nanotechnologies and co-ordinating the activities described in the Government's response on nanotechnologies across departments, agencies and Research Councils.		ongoing	-
Schoolnanorussian online platform	This is very useful web platform of different tools useful for schools. There a lot of ideas for nanocontests, labs, lessons and different events from all Russia	<a href="http://schoolnano.ru">schoolnano.ru</a>	ongoing	-
UK Nanojury	"two-way" citizens jury: traditional citizens' jury method + multi stakeholder oversight, science advisory panel, inbuilt control mechanism for jurors. results: jurors wrote recommendations for nanotechnology's future development in the UK	<a href="http://www.nanojury.org.uk/">http://www.nanojury.org.uk/</a> Informing, involving or engaging? Science communication, in the ages of atom-, bio- and nanotechnology, IN Public Understanding of Science/ Volume 18, 2009	2005?	-
UK	experimental approach + mix of adapted dialogue	Informing, involving or engaging?		+





"Nanodialogues - four experiments in upstream public engagement"	methods (people's inquiry; deliberative dialogue process involving scientists, research council staff + members of the public; workshop involving policy makers, politicians + representatives of two communities; series of focus group discussions. Results: Recommendations and presentation to DEFRA and research councils	Science communication, in the ages of atom-, bio- and nanotechnology, IN Public Understanding of Science/ Volume 18, 2009		
UK "Citizen Science@Bristol"	programme of activities seeking to engage young people in discussion about role of science and technology in society. Methods: chat-show-style debates, website resources, teachers' materials, online games. Result: participants voted on areas of NST research to be funded and the degree of NST regulation	Informing, involving or engaging? Science communication, in the ages of atom-, bio- and nanotechnology, IN Public Understanding of Science/ Volume 18, 2009	2006	+
SwissPublifocus "Nanotechnology, Health and the Environment"	focus group meetings where randomly selected citizens discussed a particular topic, given by the organizers. introduction by expert presentations . Result: report on public opinion if NT	Informing, involving or engaging? Science communication, in the ages of atom-, bio- and nanotechnology, IN Public Understanding of Science/ Volume 18, 2009 and Deliberating risks under uncertainty: experience, trust, and attitudes in a Swiss nanotechnology stakeholder discussion group, IN NanoEthics/ Volume 1, 2007 etc. (see sheet articles)	September 2006	-
European Nanologue project (see row 9)				-
Nanotoes	the NanoTOES project has together with another ITN (EIMID-ITN) conducted a 3-day workshop on risk and crisis communication. Based on input from participants and experts we have produced a brochure with practical tips and information on that issue.	albert.duschl@sbg.ac.at www.nanotoes.eu		-
Citizen	Public engagement/discussion/vote about emerging		2006	+



Science Bristol UK	technologies incl. nanotech, focus on lay students			
PLACES (ECSITE project)	creative workshop on science communication at this years annual conference	<a href="http://www.openplaces.eu/conference/sessions/80291">http://www.openplaces.eu/conference/sessions/80291</a>		-
DIALOGBASIS	DIALOG BASIS conceptualizes, moderates and guides Stakeholder-Dialogs.	<a href="http://www.dialogbasis.de/theme/n/technologien/nanotechnologien.html">http://www.dialogbasis.de/theme/n/technologien/nanotechnologien.html</a>		+
Nanosicherheit/Nationale Bürgerdialoge	<a href="http://www.nano-sicherheit.de/">http://www.nano-sicherheit.de/</a> bzw. <a href="http://www.nano-sicherheit.de/dynasite.cfm?dsmid=12196">http://www.nano-sicherheit.de/dynasite.cfm?dsmid=12196</a>	<a href="http://www.nano-sicherheit.de/">http://www.nano-sicherheit.de/</a>		+
NanoSoc - Nanotechnologies for Tomorrow's Society	was the largest Flemish Technology Assessment project until 2009, funded by the Flemish Institute for the Advancement of Innovation through Science and Technology. Its core objective was the development of a methodology to integrate societal considerations in the development and implementation of research agendas. One activity were four successive participatory rounds in which each actor was asked to contribute his views faced with those of others. An other activity were citizen's panels on "nano imaginaries"	Knowledge transfer from citizens's panels to regulatory bodies in the domain of nanoenabled medical applications, IN: Innovation - The European journal of social science research/ Volume 22, 2009 and <a href="http://www.nanosoc.be/Home-en.asp">http://www.nanosoc.be/Home-en.asp</a>	2006 - 2009	+
Nanobus (Nanobusz)	On-the-move interactive NT exhibition - inspired by Nanotruck	<a href="http://geforcee.geblogs.com/nanotechnology-passport-for-the-future">http://geforcee.geblogs.com/nanotechnology-passport-for-the-future</a>	2011-2014	+
1st comparative United States - UK public engagement experiment in sheet projects	4 concurrent half-day workshops debating energy and health nanotechnologies; aim was to develop and evaluate a novel form of deliberative workshops using a generic structure capable of being used for comparing complex public discourses about different NT applications and in different national contexts	Deliberating the risks of nanotechnologies for energy and health applications in the United States and United Kingdom IN Nature Nanotechnology/ Volume 4 2009	2007	-
Madison Citizens' Conference	The Madison Citizens' Consensus Conference took place over three weekends in spring, 2005, 13 participants. The group of panelists was demographically diverse,	Building citizen capacities for participation in nanotechnology decision-making: the democratic virtues of the consensus conference mode IN: Public Understanding of Science/	2005	-



		Volume 17, 2008		
The BigNanoMeasurement	project of Nanopodium. Vignettes (short scenarios) for assessing soft impact of Nanotechnologies	grey literature, emails with authors: Tsjalling Swierstra, Lidwien van de Wijngaert	2010	+

#### 7.4.2. Science communication

source	Name	Institution	Activity	
PCST <a href="http://www.pcst2012.org/images/BookofAbstracts.pdf">http://www.pcst2012.org/images/BookofAbstracts.pdf</a>	Ayelet Baram-Tsabari	Technion- Israel Institute of Technology	COMMUNICATING EVOLUTION THROUGH THEATRE: THE CASE OF 'DARWIN'S JOURNEY' - theatre in science museums	+
PCST	Catherine E. Crawley	National Institute for Mathematical and Biological Synthesis, Univ. of Tennessee, Knoxville	communicating science through music	+
PCST	Vickie Curtis	The Open University, UK	REASSESSING DIALOGUE	-
PCST	Jose Manuel de Cozar Escalante	University of La Laguna, Spain	SOCIAL COMMUNICATION OF NANOTECHNOLOGY	-
PCST	Anne M. Dijkstra	University of Twente	Science Café - The nanotrail project	+
PCST	Koen Dortmans	Centre for Society and Genomics, Radboud University Nijmegen	INFORMAL DIALOGUE ON SCIENCE AND TECHNOLOGY	-
PCST	Jörg Hilpert	Dialogik	Focus groups with lay public	-
PCST	Peter Kastberg	Aarhus University, Business and Social Sciences, Department of Business Communication, Denmark	Science Theatre - COMMUNICATING SCIENCE THROUGH DRAMA	+
PCST	Maria Joao Leao	Instituto Gulbenkian de Ciencia, Portugal	speeddating with scientists	+
PCST	Midori Takahashi	Shizuoka Science Museum	CULTIVATING SCIENCE COMMUNICATION IN A LOCAL COMMUNITY	+
PCST	Joachim Allgaier	Research Center Jülich, Germany	MEET ON YOUTUBE: SCIENCE IN MUSIC VIDEOS	-
PCST	Cissi Billgren Askwall	Public & Science, Sweden	SCIENCE DIALOGUE TOOLBOX – BEST PRACTICES OF SCIENCE COMMUNICATION	+
PCST	Sofia Guedes Vaz	CENSE/FCT/UNL (New University of	stand-up comedy on science, video and	+



		Lisbon)	questionnaire	
PCST	Andi Horvath	Museum Victoria, Melbourne, Australia	science communication postcards	+
PCST	Ira van Keulen	Rathenau Institute	social game for the iphone - dilemmas on human enhancement	+
PCST	Amy Sanders	The Wellcome Trust	EXPERIMENTS IN ENGAGING WITH NEW AUDIENCES	-
PCST	Alex Verkade	Very Disco Foundation	Discovery Festival Amsterdam	-
PCST	Carmen Enrique	Universidad de Granada	UNIVERSITY TO THE CITY: SCIENCE GOES OUT	-
PCST	Claire Rocks	Cheltenham Science Festival	Famelab	+
PCST	Jose Manuel de Cozar	Expert knowledge and social communication of nanotechnology	Expert knowledge and social communication of nanotechnology	-
PCST	Giovanna Pacini	University of Florence	Dissemination of science through Science Café	+
Excite	Nils Kristian Rossing,	Trondheim Science Centre, Trondheim, Norway	hands-on learning focused on exhibit development and fabrication in June 2012. Before we start building our exhibits, we are seeking your critiques and advice. They were doing some research there (how to build this). Results highly interesting for us	-
Excite	Luka Vidic, Activities Editor, Ustanova Hisa eksperimentov -	The House of Experiments, Ljubljana, Slovenia	Having made it myself, I know! Demonstrations with surprising outcomes are very memorable. Each demonstration can be presented in this way. Sometimes by just using the right words. Ten bonus points if one makes them out of materials which can be easily find at home.	-
<a href="http://mokslofestivalais.eu/">http://mokslofestivalais.eu/</a>			This festival is few days event when different scientific lectures, excursions to scientific institutions, experiments and discussions take place	-
<a href="http://tyrejunaktis.lt">tyrejunaktis.lt</a>	Scientific public event "The night of research"		A lot of scientific activities for the society, very modern and interactive tools are taken	-



Scicom Nancy	The Fishmarket	Universié de La Rochelle	market place "selling" products of scicom on	-
<a href="http://www.excitingscience.org/">http://www.excitingscience.org/</a>	only for research on further examples		"exciting" lectures for children in India	-
<a href="http://www.sciencefestivals.org/">http://www.sciencefestivals.org/</a>	only for research on further examples	Science Festival Alliance	how to organize science festivals	+
<a href="http://informalcommons.org">informalcommons.org</a>	only for research on further examples			-
PCST mailing list	Naturvidenskabsfestival	Dansk Naturvidenskabsformidling		+
Snet	Nanosupermarket	<a href="http://www.nextnature.net/events/nano-supermarket/">http://www.nextnature.net/events/nano-supermarket/</a>	'Supermarket' for NT products	-
<a href="http://www.scienceslam.at/">http://www.scienceslam.at/</a>	Science Slam /Famelab		competition on science communication	+
PLACES (ECSITE project)	creative workshop on science communication at this years annual conference	<a href="http://www.openplaces.eu/conference/sessions/80291">http://www.openplaces.eu/conference/sessions/80291</a>		-
<a href="http://data.otevrenaveda.projekty.avcr.cz">http://data.otevrenaveda.projekty.avcr.cz</a>	Open science I-III	Science communication project by Aceademy of Science of Czech Rep.	Development of scientific, teaching or science communication skills, motivation for R&D career, performing students science research activities	-
<a href="http://www.projekt5p.cz/">http://www.projekt5p.cz/</a> <a href="http://exfyz.upol.cz/didaktika/oprlz/">http://exfyz.upol.cz/didaktika/oprlz/</a> <a href="http://ufyz.sgo.cz/">http://ufyz.sgo.cz/</a>	Project 5P, KRUF, RPKUF (CZ projects funded by SF)		Projects provide specialized training to enhance teaching skills in science disciplines Primary target group: primary and secondary grammar school science teachers	-
<a href="http://www.tydenvedy.cz/index.jsp">http://www.tydenvedy.cz/index.jsp</a>	Week of science	Science communication project by Aceademy of Science of Czech Rep.	Annual science festival focusing young people and general public	-



### 7.4.3. Live events and site visits

title	short description	location	date
Nanoday		Munich	6.25.2012
Nanopolis@TUW		Vienna	
Nanoschnuppertage 09	one day at a university for young interested people	Austria	2009
Moonlightparty	The moonlight party is a Miraikan annual event celebrating the autumn's Harvest Moon (Chushu no Meigetsu). Visitors are given opportunities to participate in a variety of encouraging and exceptional, never-to-be-repeated events. We additionally offer new interactive experiences by taking advantage of the subtle, hidden connections between our permanent exhibits and moon science. In this session, I will share our past cases and exchange ideas that may help other science centers organize more successful events. We will discuss what might be the	Tokyo	2012
Nanoart Festivals		Finland, Germany	2007 2008
Seminar on NT - Swedish Consumer Association	Seminar will discuss NT risks and legislation, ethics and standardisation, consumers interests. Speakers from consumer organisations, labour unions, universities.	Sweden	9.5.2012
Nanogame "Detective in the lab"	The scientific game during which the schoolchildren (13-17 years) work in groups and solve nanotechnological problems	Russia	3.16.2012
Championship on the search on the information in natural sciences and technologies	The contest for 7-12 years schoolchildren who need to search for the information in the internet in given time and due to a given question. The field of searching was natural sciences and technologies	Russia	4.4.2012
Internet olympiad "Nanotechnology - breakthrough into the future"	It's the contest for schoolchildren, students, PhD students who need to present their projects through the internet	Russia	The contest had several steps
Contest "I live in nanoworld"	It's the contest of essays about human relationship to the nanoworld	Russia	
Science in the objective	Everywhere we can observe the footprints of the science. So this	Russia	



	activity suggest students to make observation and capture the best moments by the camera and send to the contest organizers		
Through our window we can see the nano-factory	The contest during which students explore their city and combine the results with their knowledge of nanotechnology. They create the excursion through this city and present for other students	Russia	
Nanotechnology summer schools	Nanoschool is several days event during which it's possibility to listen to different kind of lectures about nanotechnology. But this event is mostly dedicated for the university students and organize by Vilnius university.	Lithuania	
Contest "Distilled ideas"	The interactive contest of movies for young schoolchildren from 13 years old. The young people have 169 seconds to represent their scientific ideas or discoveries which changed our world. They make a movie and send to the organizers, later it is shown on youtube nad people can vote virtually	Lithuania	
nanovignets writing project (Tsjalling Swierstra of the University of Maastricht)	Projectleader for the vignets was Tsjallings Swierstra. He is my promoter. I know he is very busy so you might as well contact Dirk Haen, a phd-student of Swierstra who was closely involved in the project as well (d.haen@maastrichtuniversity.nl). Please tell him you received his mailaddress from me.	University of Maastricht	
societal dialogue project	see nanopodium	NL	
EMM Augsburg	nanoday within nanoyou project <a href="http://www.galerie.jakob-fugger-gymnasium.de/gallery/emm2010">http://www.galerie.jakob-fugger-gymnasium.de/gallery/emm2010</a> siehe auch "Bericht" und "Wissenswelten" auf: P:\eLearning Competence Team\PROJECTS\Nanopinion\WP 1\Task 1.2\Analysis\sources	Augsburg	2010
Naturvidenskabsfestival	Highschool students givesinspiration to Secondary School pupils on a "market" in both Copenhagen Zooand Aalborg Zoo and lots of other municipalities and schools are involvedin other ways all over the country. It is organised through "DanskNaturvidenskabsformidling". You can reach them on <a href="http://www.formidling.dk/">http://www.formidling.dk/</a> (englishin left low corner)	Denmark	24.- 28.9.2012
Night in Nanopolis	Feature show at the at New Stage of the National Theatre that fuse sci lectures, experimets with dance, rock music and visual art about nanotechnology.	Czech republic	23.11., 12.12.201 1
Nanoscope Redux	Exhibition of Contemporary Art inspired by nanotechnology or utilising nanotechnology at the University of Pardubice. Exhibitions was accompanied by series of motivation workshops and seminars for students on nanotechnology and art design.	Czech republic	V/2011- X/2012





#### 7.4.4. Articles and papers

title	Journal/volume	date
Deliberating the risks of nanotechnologies for energy and health applications in the United States and United Kingdom	Nature Nanotechnology/ Volume 4	2009
Informing, involving or engaging? Science communication, in the ages of atom-, bio- and nanotechnology	Public Understanding of Science/ Volume 18	2009
Knowledge transfer from citizens's panels to regulatory bodies in the domain of nanoenabled medical applications	Innovation - The European journal of social science research/ Volume 22	2009
Deliberating risks under uncertainty: experience, trust, and attitudes in a Swiss nanotechnology stakeholder discussion group	NanoEthics/ Volume 1	2007
Coping with uncertainty: Assessing nanotechnologies in a citizen panel in Switzerland	Public Understanding of Science/ Volume 18	2009
Building citizen capacities for participation in nanotechnology decision-making: the democratic virtues of the consensus conference model	Public Understanding of Science/ Volume 17	2008
Public perception of nanotechnology	Journal of Nanoparticle Research/ Volume 10	2008
Reflection upon the UK's citizens' jury on nanotechnology: NanoJury UK	Nanotechnology Law and Business / Volume 3	2006
Democratizing Nanotechnology Dialogue	Master thesis, Lund University	2009
Nanotechnologien aus der Sicht von Konsumenten	Research report	2012
Nanotechnology Risk Perception and Communication	Risk Analysis	2011
Proposal for the implementation of new knowledge in the interdisciplinary field of "nanotechnology" in the teaching of science in secondary education and contribution to student teaching chemistry in this field	Master thesis, Charles University	2011
Nanotechnology in teaching physics in secondary schools	PhD thesis, University of Ostrava	2011
Nanotechnology, as part of the school curriculum in high school chemistry and bachelor's degree program	Master thesis, Palackeho University, Olomouc	2011
Materials near and distant future -Nanotechnologies and nanomaterials	Master thesis, Masarik University, Brno	2012
Role of NanoEducator in Nanotechnology Education	Master thesis, Palackeho University, Olomouc	2009



#### 7.4.5. Interview partners

<b>Name</b>	<b>institutions</b>	<b>location</b>
Paul Hix	Deutsches Museum, NanoToTouch	Munich
Stefan Thalhammer, HP Sorge	Helmholtzcentrem, Nanoshuttle	Munich
Ineke Malsch	Malsch TechnoValuation, Nanopodium	Utrecht, NL
Jose Manuel de Cozar-Escalante and Javier Gòmez-Ferri	University of Valencia, Nanodialogue	Valencia
Andrea E. Reinhardt	chair of nanofuture; Chair of WG Communication	1000 Brussels - Belgium
Antonio Gomes da Costa	Ecsite, Places project	Lisbon



## 7.5. Conclusions Summary of Nanochannels (Deliverable 6.2 – Final evaluation report)

General conclusions and perspectives	Topic (context from which these findings emerged)	Channel (channel through which these findings emerged)	Comments (observations from activities to support findings)
1. Providing people with more information on the benefits and risks of nanotechnology, engages them more effectively.	Nanomedicine	Survey	Societal aspects and the balance between risks and benefits was seen as most relevant to the majority of respondents/participants
	Labelling	Focus groups	Labelling should have sufficient information on benefits and risks for the consumer to make an informed choice (not just warnings - scaremongering)
		TiConUno/ Moebius Scienza Radio	Higher rate of response to programme on labelling issues (160 have responded to the programme on labelling, 81 to the programme on food packaging) but the differences between episodic and consistent, well-timed promotional activities described earlier in this evaluation should be noted.
	General risk	Facebook posting (source SF Chronicle)	Comparatively large number of hits demonstrates higher degree of interest
2. Benefits are first assessed relative to cost, when considering non-food or cosmetic products (for which consideration of potential risks becomes relatively more important).	Environmental issues	Opinion polls	Overwhelming majority voting in favour of using nano-enhanced products including suntan lotion and tennis racquets.
		Focus groups Opinion polls on microsites	Risk of nanoparticles leaching into the water system discouraged willingness to use certain nano-enhanced products.
3. Anchoring nanotechnology to a product that has relevance to the individual is critical to raise motivation for engagement, i.e. a general discussion on nanotechnology does not work as well as, for example, discussion on food products, or sports equipment, or novel medicines.	Real-life applications and immediacy - any topic relevant to target stakeholder group	El Mundo Opinion Poll	“Would you use products, just like sunscreens, made with nanomaterials?” was the most answered poll question - 1,097 responses
		Sports focus groups Social media items Guardian Brand Aid Panel	Demonstrated more interest in such products - impact and engagement
		Surveys	Around 90% wanted to know whether they already used a product containing nanotechnology



General conclusions and perspectives	Topic (context from which these findings emerged)	Channel (channel through which these findings emerged)	Comments (observations from activities to support findings)
This allows a value-led (rather than abstract) debate: what is important to individuals and groups within society, how does nanotechnology impact these values (or not).	Less popular topics	Microsites	Such topics tended to have a shorter reach/less impact/less engagement:
			<p>Researchers find microbial nanowires can conduct electrons:Art:1623779 1,143 870</p> <p>Aiming for clinical excellence:Art:1667216 1,080 879</p> <p>Nanotechnology can launch a new age of space exploration:Art:1731890 1,059 888</p> <p>Is nanotechnology safe in the workplace?:Art:1702406 1,014 816</p>
4. There needs to be sufficient information for informed discussion - not too little (causing insecurity) or too much (causing people to switch off).	All, especially Introduction to nano; Nano applications (esp, health).	School groups Supplements	Accurate pitching of content is crucial, regardless of subject matter.
		Focus groups	Too little information or 'dumbing down' can also be seen as 'patronising'
5. Nanotechnology is considered by individuals as framed with the different expectations and needs that people have: Therefore there are quite different motivators for different groups, and engagement needs to build on these underlying beliefs if it is to be successful in achieving a public consensus, i.e. it is critical to know your audience.	Health and other	School events	Consensus that the event had increased their knowledge of nanotechnology (pupils and parents) - accurate targeting
	Sports	Guardian supplement - Brand Aid Panel	
6. To interact with different societal groups, different channels need to be employed. These also need to link well with each other to provide a consistent message, that is available to people in a format and at a time of their choice (e.g. not broadcasting science radio and TV programmes late at night).		Round table	Events where various channels were employed and integrated tended to engage a larger and more varied audience. Integrating communication channels that they could use in their own time and in real time proved successful (Twitter, microsite comments, etc complementing the round table)
		School events	Essential to match activity/engagement type with audience demographic
		Ti Con Uno / Moebius Scienza Radio	Expert interviews were broadcast, made available as an iTunes podcast, supported by an article published on the Moebius Scienza and NanoChannels websites, and promoted through the Moebius Scienza Facebook page (around 3160 friends). Dedicated surveys were created on the Moebius Scienza website to follow opinion/ comments, short videos on the discussion were published on YouTube.



General conclusions and perspectives	Topic (context from which these findings emerged)	Channel (channel through which these findings emerged)	Comments (observations from activities to support findings)
			TiConUno broadcast interviews with a class of students at the radio studio, and the school debate organised by the same class. TV interview of Dr Federico Pedrocchi was organised to promote the project and the radio broadcasts = full integration
7. Social media channels such as Facebook and YouTube are useful to broadcast information, but are perceived to be more opinion than fact. However, they can encourage people to look for further information/corroboration (largely through Google and Wikipedia).	Any	Survey  Focus group  Microsite (traffic source = facebook)	The different channels used by different societal groups to access information- most groups consider the internet to be the best source of information, even if they do not use it. However, for the younger generations it is the first place they search for new information.
	Any	School events	Facebook is by far the main social media domain but pupils were reluctant to use it if they knew that teachers had access to their profiles. Anonymity/pseudonymity was preferred by some.
8. Traditional media is still important (at least for raising awareness) in most of the societal groups.	Any	Survey Radio Press	Caveat: The focus group participants felt that science was driven more by commercial interests (than the public good). This engendered a lack of trust in the objectivity of information provided by authorities. (eg. Channel of communication mustn't be seen as a gov't mouthpiece / spin doctoring)
9. Use existing platforms to engage with the public rather than creating new ones (this means newspapers, radio, TV) - the numbers of individuals engaging with each of these far outnumbered newly created channels (e.g. such as a new Facebook page).	Topics that are less specialised, highly relevant to public	All established channels  Debates / round tables / focus groups	Project websites have to be fully integrated to prevent them being a bubble. Importance of SEO.  However, round table etc was newly created. Engaged people and they wanted to find out more. Bespoke tools have to be carefully considered. Personal engagement tended to be successful
10. Surveys are quite targeted dependent on who releases them and where they are promoted. In the NanoChannels survey most respondents had some prior knowledge of nanotechnology (i.e. self-selecting).		Survey	Response rate and engagement level may also depend on nationalities Issue of religious questions
11. Perspectives of different practitioners are important to	Health, environment	Round table Focus groups	Raises issues that hadn't occurred to other participants. Thought provoking.



General conclusions and perspectives	Topic (context from which these findings emerged)	Channel (channel through which these findings emerged)	Comments (observations from activities to support findings)
the wider public, in order for the non-expert to make up their minds. This requires different types of organisation and individuals to actively participate.			
12. Personal interactions remain the best way of engaging with the wider public, especially if a variety of perspectives can be presented. Failing that, information from a trusted source(s) is needed. In this regard focus groups proved to be more effective allowing discussion of all issues. Members of the wider public accept that all new technological developments have advantages and disadvantages, and they want especially to be appraised of the latter. Participatory activities like this (for the wider public, rather than only for special interest groups) can help facilitate decision-making processes.	All, including discussions on public engagement itself	Facebook	Seen as more personal, but can therefore have opposite effect
		Focus groups, Round table	Public engagement requires expert input from impartial source.
		Schools	Consensus among teachers that they would like interaction with other schools.
13. The perspective of the organisation initiating the engagement process e.g. a government agency, should not be allowed to overcome the experience of the professional undertaking the engagement process. Objectives must be clearly set, however the professional must use the	All - health, medicine	Supplements	Need to engender trust in the objectivity of information provided by source - again channel of communication mustn't be seen as a government mouthpiece / spin doctoring / industry influenced.



General conclusions and perspectives	Topic (context from which these findings emerged)	Channel (channel through which these findings emerged)	Comments (observations from activities to support findings)
approach they believe to be most effective in achieving this (compare the first Guardian supplement with the second).			





