



PLACES

Platform of Local Authorities and
Communicators Engaged in Science

Modules used: A1, A2, C1

Science Event

2012

This is a standardized version of the original case analysis number 6. Specific names and locations have been substituted from the original document number 6 with generic references in order to preserve the anonymity of every participant.

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Abstract

The event chosen for this case study is a larger local event within the national festival of research which includes a comprehensive programme of activities, broadly relating to the future and challenges of Europe. The research strategy for this case study aims to measure impact within the two dimensions: the public (individual citizens) and relevant actors involved in this particular science communication event. Semi-structured interviews with visitors (new and repeated visitors) and relevant actors composed of researchers and science institution representatives were performed, along with a standardized survey of visitors.

The measuring of impact of this specific science communication initiative within these two dimensions, involves a range of various indicators related to educative values of the festival, personal benefits for researchers and institutional benefits, such as improved public image and increased public accept of research. In general, main findings indicate that visitors and central actors, such as researchers and institutional representatives, by and large are very satisfied with the event and that they regard this festival to be a valuable science event with regards to its form and content. Furthermore, figures indicate that visitors find this type of interactive hands-on exhibitions, as well as the opportunity for dialogue with researchers, to be a beneficial and interesting form of science communication. The fact that interviewed visitors find that the scientific content has personal relevance, indicates that researchers are capable of disseminating scientific and technological issues in a tangible and comprehensible fashion, which facilitates public understanding of key concepts and the engagement with science. However, when it comes to short-term impact on increased confidence as to discuss scientific issues, the science event has only had a relatively small impact in this regard.

To the interviewed researchers, participation in this science event has yielded relevant feedback about public response to research, while no noticeable effects were obtained with regards to career enhancement or any heightening of science communication skills. For the university as an organizing institution, main results suggest that the event seems to bring with it certain definite branding benefits and has helped increase the visibility and public image of the university in the general public. However, the relatively low number of visitors this year indicates that the event to a lesser extent has met the objective of disseminating research to the broader public.

Introduction

The national case study constitutes a science event which takes place in connection with the national festival of research, from the 19th to the 21st of April 2012. The festival is a large scale national event targeting the general public, and its primary objective is to 'rouse public interest in and enhance public understanding of the methods, processes, and outcome of research and science' thus making scientific work more easily accessible to the national population. In this manner, the objectives are consistent with the most recognized purposes of science communication events; to "raise public awareness of science" and to promote the dialogue between science and society".

The ministry of science, Innovation and education initiated this science event in 2005, and the agency for science, technology and innovation is responsible for the main organization and coordination of the event. With regards to funding, this year it was possible to apply for grants up to 8.048,67€ for arranging an event. The total budget for 2012 amounted to 134.144,53€. A number of organizations and institutions such as universities, companies, hospitals, education- and cultural institutions and municipalities come together to arrange more than 200 free events (around 600 specific activities were offered in 2012) across the country. The events are multi-disciplinary, open to everyone interested and include activities such as presentations, dissemination shows, researcher panels, guided tours etc. Furthermore, various institutions and associations can 'order' a researcher free of charge within the time span of the festival. Thus, 377 presentations were held in 2012. The main event was evaluated in 2008, and 78% of visitors proved to be satisfied with their participation in the event, and 98% believed that the event is a very good way of increasing public interest in science.

The specific event chosen for this case study is a larger local event at a university. This event –with this year's main theme "EUROPE"– took place on the 20th of April, 2012 from 13:00 to 18:00 and included a comprehensive program of workshops, speed lectures, exhibitions, experiments, among other activities broadly relating to the future and challenges of Europe. A range of various topics such as food culture, religious roots, CO₂ emissions, nano-science, active ageing, sperm quality, food safety, among several other subjects, were on the agenda. The event was, as the main national event, held for the eight year running. Earlier themes have dealt with themes such as love, body and culture and climate, among other. The event is mainly coordinated by a task group consisting of a project event manager from the university communications back office, together with the head of events and

communication employee and representatives from the four main faculties at the university, Arts, Science and Technology, health and Business and Social Sciences.

The objectives of the event are in keeping with the main national event; however for the university as an institution, it is also an important part of the university's science dissemination obligation to communicate research –or part of it– to the broader public and “important and fair” to show taxpayers how their money is being spent. Furthermore, the event also provides an opportunity for researchers to disseminate and receive feedback and public response to their research (head of events, appendix C, p. 100). The target audience is –as with the main event– also broadly everyone interested, and the science event at the university is in general perceived and evaluated as a success, as it is quite well attended and well received by visitors, researchers and institutional representatives. Every year, the event sees informal evaluation by the task force and internal actors involved in the event, with the exception of the 2010 event, where an additional, standardized survey of visitors also was held. The event location at the university varies each year. This year, the science event was held at the department of mathematics in the foyer area and adjacent auditoriums. In 2010, the event was located in the largest auditoriums at the university and had a record-breaking number of around 1.500 visitors. It was assumed that the theme ‘body and culture’ to a great extent explained the high number of visitors as well as the very high proportion of young people (15-19 and 20-29 age range) attending the event. The 2010 event survey results largely demonstrated a high visitor satisfaction, with 91% stating they would be interested in returning to the event (none stated that they would not return).

Furthermore, visiting time for more than half of the visitors was two hours or more, indicating that the form and content of the event was capable of maintaining the interest and engagement of visitors. In general, the main conclusion was that the science event at the university is a valuable science communication initiative for all interested, much in accordance with the general and recurring perception of the event, as mentioned above.

Thus, the scale and scope of this science communication event (both on a local and national level) in terms of attendance and popularization of the event, coupled with the fact that it is a highly prioritized science event from the part of the university, makes the science event a desirable and suitable choice for case selection within the scope of the PLACES project.

Research questions and potential effects of the science event

The research strategy for this case study aims to measure impact within the two dimensions; the public (individual citizens) and relevant actors involved in this particular science communication initiative, since these dimensions are the

most suitable and relevant dimensions for evaluation in the case of the science event at the university. Thus, during the actual event, semi-structured interviews with visitors (first timers and repeat visitors) were performed, along with a standardized survey of visitors (149 valid questionnaires were collected out of 198 distributed questionnaires, see section 3).

Furthermore, subsequent interviews with relevant actors were conducted; in this case these included interviews with researchers participating in the event in order to measure impact in terms of, for instance, acquired skills and benefits for their work. Moreover, interviews with representatives from the university (science institutions representatives) were performed in order to measure the impact of the festival at the institutional level in terms of public image, competitiveness, increased interaction between the university and industry etc.

The case study has intended to answer the following and main questions:

- How do visitors perceive the science event at the university (2012 event)?
- What are the personal impacts for visitors participating in the science event?
- What are the long term effects for recurring visitors at the science event?
- How do the participating researchers perceive the science event at the university (2012 event)?
- What are the impacts for researchers participating in the science event?
- How do institutional representatives perceive the science event at the university (2012 event)?
- What are the impacts for the university as an institution in participating at the science event?

More specifically, possible effects sought explored and established are:

On public

- Immediate impact: Short-term science learning, attitudes towards S&T, attitudes towards the science event at the university, motivation, participation in science, self-esteem, confidence.
- Long term effects: Long-term science learning, intellectual curiosity (memorable experiences, changes in behaviour, and participation in S&T policy related events), interest in following S&T news/events/innovations.

On actors

- Researchers: Engagement, motives, learning/getting feedback about public response to research, raising new research topics and questions,

acquiring communication skills, career enhancement (new networks/collaborations).

- Institutional representatives (impacts for the university as a science institution): Visibility, competitiveness (recruitment of researchers and students), increase public acceptance of research (public image), learning/getting feedback about public response to research, economic benefits, public/private interaction (new partnerships).

Methods

The following section presents particular modules and methods applied for this case study. Furthermore, a description of sample selections and more detailed methodical specifications, regarding the application of semi-structured interviews and a standardized survey of visitors, are outlined as well.

Table 1. Modules and methods applied

Instruments:	Number of interviews/sample size:
Impact on the public:	
<ul style="list-style-type: none"> Institutional sources: About visitors, organization of the event etc. 	Documents, websites and information from organizer were applied
<ul style="list-style-type: none"> Module A1: Semi-structured interviews with visitors (including module for repeated visitors about long-term impact) 	5 semi-structured individual interviews with visitors (two of them recurring visitors) were carried out during the event
<ul style="list-style-type: none"> Module A2: Standardized survey of visitors 	149 valid questionnaires (out of 198 distributed) were collected during the event
Impact on actors:	
<ul style="list-style-type: none"> Module C1: Semi-structured interviews with relevant actors (at event level) 	<p>3 semi-structured individual interviews with researchers were carried out subsequent to the event</p> <p>3 semi-structured individual interviews with institutional representatives from the university were carried out subsequent to the event</p>

Semi-structured interviews

The use of semi-structured interviews allows for an exploration of attitudes, motivations and engagement related to the various informants' experiences, understandings and practices when it comes to being engaged in this particular science communication event.

Thus, through the statements, perceptions and experiences of informants –in this case of visitors, researchers and institutional representatives– it is possible to obtain in-depth information regarding potential changes in behavioural patterns effecting areas such as science learning, enhanced communication skills, learning and feedback about public response to research, caused by the participation in this science event. In terms of establishing

personal impacts for visitors, the individual interviews can help clarify and validate findings from the standardized survey.

Selection and recruitment of informants

Informants for visitor interviews were approached and recruited during the actual event. Five interviews were attained during the five hour time span which in reality constituted a shorter time period since visitors naturally needed time to experience the science event before their subsequent participation in the interview process.

The recruitment process proceeded fairly easily and all visitors approached, except for one, agreed to a short interview which lasted for approximately 10-15 minutes. Due to lack of any prior visitor knowledge, the only variables noted were age and gender. An outline of visitor informants is presented in table 2 below. No detailed descriptions are given, to preserve the anonymity of visitors.

Table 2. Outline of visitors participating in semi-structured interviews				
	Age-range	Sex	Occupation	New/recurring visitor
Visitor 1	30-59	Female	Employed	Recurrent
Visitor 2	30-59	Female	Employed	New
Visitor 3	60-	Male	Retired	New
Visitor 4	16-29	Male	University student	New
Visitor 5	16-29	Female	University student	Recurrent

Researchers and institutional representatives were recruited by personal request (first an informative mail and subsequently –if not established by mail– a telephone call in order to arrange interview appointments). All informants were very cooperative and the recruitment process proceeded without problems. Despite the small number of informants, representatively in terms of various factors was strived for, and researchers were selected based on their various positions, institutional belongings and tasks at the festival of research. Institutional representatives were primarily selected due to their respective positions with the university and their main tasks at the event.

Thus, the head of events (main responsibility for the science event), the project manager (primary organizer and coordinator of the event) together with a task group member representing the ARTS faculty (contact with researchers) were interviewed. All interviews were carried out face-to-face and in the national language with the exception of one interview in another language with the researcher from the department of business administration. None of the above-

mentioned informants chose to be anonymous. An overview of both researchers and institutional representatives are included below.

Table 3. Outline of researchers participating in semi-structured interviews

	Position	Department	Sex	Task at Festival
Researcher 1	Professor	Department of Molecular Biology and Genetics	Male	Two speed-lectures on 'protein crystallography and future national companies'
Researcher 2	Post doc.	Department of Geoscience	Female	Two speed-lectures on 'the European energy challenge'
Researcher 3	Professor	Department of Business Administration. Connected to a centre for research on customer relations in the food sector.	Female	Facilitator for activities in the foyer area (during the entire event). 'Workshop' on consumer behavior and food choice and experiments including various research methods

Table 4. Outline of inst. representatives participating in semi-structured interviews

Institutional representative/ Position	Department	Task at Festival
Head of Events Day to day management of events and recruitment	University communication – events. Back Office	Main responsibility for the science event at the university
Communication employee Coordinator of various events and conferences.	University communication – events. Back Office	Project manager/main organizer of the science event at the university
Communication employee Editor of faculty magazine, communication and press adviser, research communication and events	University communication – arts. Front Office	Task group member of organizing the science event at the university Recruitment of researchers

Methodical specifications

Interview guides for visitors, researchers and institutional representatives were translated into national language from the original toolkit versions. Minor adaptations were made (for instance modifications of a few questions and wording) to fit the particular case, as well as the sections for recurrent visitors regarding 'consumerism' and 'other' were omitted due to lack of relevance and to keep the guide fairly short. All interviews were recorded on a digital recorder and subsequently transcribed. The software program Nvivo has been applied to assist with the management, structuring and fitting the thematic of interview data, in order to facilitate systematically coding and analysis.

Furthermore, applying the form of semi-structured interviews has allowed for some flexibility, and a more 'natural' and dynamic flow of questions, as well as a more in-depth exploration of responses and emerging themes/points.

Standardized survey of visitors

A standardized survey of visitors is a valuable method for collecting quantitative and structured data reflecting representative information of the population under study, in this case information about who participated in the science event at the local university. Furthermore, this type of data collection allows for the obtainment of knowledge of visitors' attitudes towards the event and their attitudes towards S&T; furthermore, it provides specific and outlined information of science learning attained during the actual event. Thus, applying a standardized survey should assist in establishing the personal impacts for visitors participating in the science event.

Due to the character of the event (one event per annum, within a limited time span) the research design of this study is one-off cross sectional featuring a focus on existing differences and a lack of a time dimension, which makes the design less suitable to measure change in terms of measuring long term effects for recurring visitors. It is not the ideal; however, a time dimension is to some degree incorporated by asking retrospective questions as regards behavioural changes etc. Nevertheless, the strengths of this survey design lies more with its ability to measure impacts of the specific 2012 event.

Selection of sample

Questionnaires were collected during the event by 6 interviewers in total who approached and recruited participants above the age of 16 in person and asked them to complete paper-and-pencil questionnaires. Respondents were primarily asked to return the questionnaires to one particular interviewer, stationed at an event booth allocated to the case study.

Alternatively, visitors could return questionnaires in boxes especially provided for the purposes of this study. Visitors were approached at various event locations and before and after the many different speed lectures, to increase representatively. Refusals to participate in the survey were noted in terms of their gender and their reasons for not wanting to participate, if these were provided voluntarily. However, visitors approached were remarkably willing to participate and very few refused directly. Reasons for this were for instance lack of time and that they did not actually participate in the event. Few were also rejected due to their young age. In general, nothing indicates systematical non-responses for certain groups of participants.

198 questionnaires were allocated whereof 149 were answered, which gives a response rate at approx. 75%. No exact figures exist regarding the actual number of visitors, due to the many entrances at the department of mathematics which makes a detailed visitor count unobtainable. The organizers of the event estimate the number to be around 800 visitors; however judging from the number of questionnaires distributed, interviewers contact with visitors and size of location, our conservative estimate yields a maximum of 500 visitors.

Methodical specifications

The standardized survey was translated into national language and adapted to fit the case in question. The questionnaire was constructed so that it could be completed by hand and the two last sections (from question 19 and onwards) were excluded due to lack of relevance. With regards to the demographic section, the ethnicity variable was omitted, closed formats were applied for the sex and education variable whereas open codes were applied for the remaining.

Survey data were entered and set up for analysis by means of the software program SPSS, exported to Excel and finally reported as word tables. The analysis of survey data includes descriptive statistics (univariate and bivariate techniques) and is reported and displayed as frequency- and cross-tabulations (see appendix A & B).

Results

The following section presents the main results of the case study and the analysis will –in accordance with the previous stated research questions– assess how the science event is perceived by visitors and various actors as well as assess the impacts of the event. Descriptions and analysis presented below takes as their point of departure tables and interview transcriptions included in appendix A, B and C.

Personal impacts for visitors participating in the science event

The following sections focus on short-term and long-term effects with regards to visitors' science learning, attainment of confidence, increased intellectual curiosity, attitudes towards S&T, among others. First, findings on visitor characteristics and attitudes towards the event will be reported.

Visitor characteristics and perceptions of the event

Respondents are distributed equally across genders and fairly equally among the age ranges 16-29, 30-59 and 60+ with only a small majority of adolescents. This could suggest that the event theme 'Europe' for this year has a generally broad appeal across various age groups. The majorities of respondents have either a medium-cycle or long-cycle higher education as their highest qualification (32% respectively), whereas visitors with a secondary education (17%) and a vocational certificate (8%) primarily constitute the remaining group of respondents. All respondents, except two foreigner citizens, live in this country and the majority resides in the city and its vicinity, which indicates that the event is mainly a local and regional established one.

To 69% of respondents, their visit to this year's science event was their first time attending the festival; 11% had visited the event once before, 5% twice and a group consisting of 14% of respondents has visited the event three times or more before. 43% of respondents attended the event alone, and the remaining 57% either visited the festival with friend(s) (29%), family (19%), or fellow students (9%), respectively (4% stated other). With regards to visitors perception of the event, 38% found the event a lot more interesting when compared to visiting an art gallery or another cultural event, 26% found it a little more interesting and 28% state that it is about the same. These ratings point to a comparatively high satisfaction with the event and suggest that the science event at the university is regarded as a valuable science event with regards to its form and content.

This is substantiated by the fact that 70% of respondents either strongly agree (especially the 60+ age group) or agree that the science event plays an important part of the cultural life of the city, while 72% either agree or strongly agree that the event is an important symbol of the city. Respondents assess the impact of the event on the city to be somewhat smaller as regards its part in the economic development of the city as only 34% of respondents either agree or strongly agree to this. The majority (48%) neither agrees nor disagrees.

The five interviewed visitors chose to visit the science event for several reasons; an interest in specific topics presented at the event, a wish to see and explore new scientific developments, as well as a personal interest to become acquainted with the son's place of employment. All visitors are satisfied with the event in general and both form and content of the event appeals to them; they like that so many topics and subject areas are presented, and they like the interactive form of disseminating science, which make the event significant compared to other cultural and scientific institutions.

If you want to know something, if you are interested in something, you can go and ask questions. I think that is good (Visitor 2, appendix C, p.53).

Easy access to qualified professionals and their knowledge about a specific topic is thus a commendable feature of the science festival. The event is furthermore perceived as accessible to the broader public:

"I thought, the first time I came here, can I benefit from this; I am an ordinary person, I am a nursery teacher, who does not even have a GCSE, which is standard for this type of education, and I thought; can I get something out of this? But I do think that I can. I am glad that it is not just research beneficial for the elite, research which the elite can relate to but that the rest of us can too and that you make an effort in order for the rest of us to get something out of it as well" (Visitor 1, appendix C, p.50)

All visitors furthermore agree that the event is important for the city, and as one of the informants further remarks, this is primarily due to the fact that city is a university town.

"It is part of our self-understanding in the city, so it is evident that this picture is emphasized, understood and maintained, and that the annual regatta at the lake is not people's only image of the university" (Visitor 3, appendix C p.57).

The other visitors, however, also stress that the event is more important for the image of the university than it is for that of the city, and as one visitor moreover points out, is it important that the university is not only reserved for students but figure in "a more open environment, where everyone can take part" (Visitor 4, appendix C, p.63) and thus becomes an integrated part of the city.

Immediate impact for visitors

Science learning

When asked to compare their experience of learning about science during their visit to the science event to that of learning about science in school, 64% of respondents state that they find the former to be a lot more or a little more interesting. 17% state that it is about the same, whereas 9% find it a little less interesting. The figures indicate that visitors find this type of interactive hands-on exhibitions, as well as the opportunity for dialogue with researchers, to be a beneficial and interesting form of science communication.

Especially the 60+ and subsequently the 30-59 age groups find this way of learning about science a lot more interesting. This probably reflect that these respondents' experiences with science education in schools include more traditional formats of science communication compared to today's younger generations, who probably have experienced that the development of science education in schools, the reinforcement of science teacher training and science didactics have been a strategic and political focus area within the last decade.

All interviewed informants can, to some extent, relate the scientific contents exhibited and explained at the science event to their own everyday life; for instance when it comes to food and health topics. One visitor also mentions the possibility of measuring water levels in specific areas, and she very concretely found out that if the near shallow strait increases its water level by 3.68 metres, her sister's house will be flooded. The fact that visitors found the scientific content of personal relevance indicates that researchers were capable of disseminating scientific and technological issues in a tangible and comprehensible fashion, which facilitates visitors' learning of key concepts and their engagement with science.

Attainment of confidence

40% of respondents report that their visit to the science event have made them feel a little more confident in discussing scientific issues, whereas 51% state 'neither more or less confident'. The relatively small impact on increased confidence is reflected among the interviewed visitors as well. Two of them state that they perhaps would feel a little more confident recounting some of the scientific content achieved at the event to family and friends, whereas informant 3 already felt quite confident discussing scientific issues and felt that the festival did nothing to change this in any direction.

The two interviewed university students report that they have attained more confidence in discussing some of the topics presented during the event since they have gained new knowledge and some new arguments for future

use. One of the students, however, adds that the relatively short lectures “roused the appetite” for more knowledge rather than increased the level of confidence.

Long-term effects for visitors

Science citizenship and intellectual curiosity

30% of respondents have visited the science event at least once before. Of those, 18% states that they, following their last visit/s, have sought out more information on science and technology. This includes both men and women but those in particular with a secondary education and medium/long cycle higher education, whereas those with a primary education or vocational certificate have been less inclined to look for additional information.

However, the fact that more than half of the respondents have searched for more information following their last visit/s indicates that the festival has had a small positive impact on visitors’ interest in science and technology issues. This is also the case for attainment of confidence; 16% of respondents –with a majority of men between the age range 30-59– state that their previous visit/s have made them feel a little more confident discussing scientific issues, whereas the remaining recurring visitors answer neither more or less confident.

The two interviewed visitors who have visited the science event before have not been more involved in S&T policy related events as a result of these visits and neither have they followed news stories about science and technology in the media more closely than they normally do. However, both state that they will probably be more inclined to search for more information about nano-technology and health technology, respectively, as a result of their current visits.

Thus, for these recurring visitors, the science event has not had an impact on their scientific citizenship and only a minor impact in terms of increasing their intellectual curiosity. Nevertheless, it is important to include the point, stated by one of the visitors that: “It is common knowledge you can bring along, which is really good to have” (Visitor 5, appendix C, p. 69) and as she furthermore remarks, is it not possible to know precisely when it will come in handy. This indicates –as have been mentioned earlier– that the science event has succeeded in disseminating knowledge within a broad range of scientific issues.

Visitors’ general attitudes and beliefs about science and scientists

Visitors’ more general perceptions of science and scientists by and large reflect an optimistic attitude towards issues of science and technology which is consistent with the general public opinion in the country. Thus, 87% of

respondents either agree or strongly agree that 'science and technology will make our lives easier, healthier and more comfortable'.

Despite this general consensus, various socio-demographic factors influence the tendency to 'strongly agree' with the statement; this is especially the case for younger and middle-aged men with a secondary or long cycle higher education. The same general consensus (88%) is found when respondents are asked whether it is important to know about science in their daily life; however compared to the former statement, those who 'strongly agree' are more broadly represented across various socio-demographic factors, with the 30-59 age group being most inclined to answer "yes" in this category.

With regards to trust in science and scientists, respondents' answers exhibit a markedly smaller degree of overall consensus than was the case with the previous statements. Still, 67% of respondents either agree or strongly agree that 'before scientific findings are published, other scientists check them'. 20% neither agree nor disagree.

The picture is more diffuse when responding to the statement; 'it is common for scientists to adjust their findings to suit their founders' interest'. 28% agree or strongly agree to this, and 34% disagree or strongly disagree, whereas 32% neither agree nor disagree. In general, the population of this country have confidence in key actors such as university scientists and institutions which regulate matters regarding science and technology, whereas this relatively high percentage agreeing to scientists adjusting their findings to founders' interest indicate a mistrust in scientists, if the adjusting of findings include manipulation of data (and thus unreliable and invalid findings) at the cost of financial interests.

However, how the term 'adjust' is perceived and what it is taken to include, is complicated to determine, and the fact that one third neither agrees nor disagrees, might be interpreted as a symptom of this equivocation. Respondents are also divided in their answers with regards to whether 'scientists should listen more to what ordinary people think'. 40% either agree or strongly agree with this statement while 18% disagree or strongly disagree. Again, a rather large percentage –38%– neither disagree nor agree, which could indicate that respondents on one hand have confidence in scientists and their expert advice and on the other hand also believe that scientists should be engaged in people's everyday life rather than be "stuck up" up in their ivory towers. Respondents' answers to the above-mentioned two statements could also reflect a potential concern about moral and ethical issues with regards to the sciences, since the population of this country in general gives priority to ethics before science and find moral and ethic issues in governance important (reference 5).

The five interviewed informants all share the respondents' prevailing, optimistic attitude towards science and technology issues and all consider science to be important and fundamental for societal progress. Still, two visitors explicitly voice an ethical concern for the negative effects of science and the utility of research and emphasize the need to consider any possible risks, for instance with regards to nanotechnology, which is a matter of great concern for one of the visitors.

The remaining visitors also prioritize ethical and moral matters when it comes to science; however their general attitudes towards science indicate that the possible benefits and trust in researchers complying with ethic regulations outweigh the possible concerns about risks and misuse of research.

Impacts for researchers participating in the science event

Below, an account of researcher involvement in the science event will be presented, along with an analysis of the impact that participating in the event has caused on these interviewed researchers. Impact dimensions include acquired communication skills, career enhancement and getting feedback about public response to research, among others.

Involvement in and perceptions of the event

The interviewed researchers became involved in the event in different ways. One signed up himself after having received information about the event, one was approached by a colleague and encouraged to participate, and in the case of a centre for research on customer relations in the food sector, their participation in the event was decided at a departmental research centre meeting. They have participated annually and wished to present research performed at the centre as well as collect data for a research project through various experimental activities carried out during the event.

A wish to disseminate one's research also constitutes a main motive for participation for the remaining researchers. As the researcher from the department of molecular biology and genetics states: "I think it is really amusing to convey [research] to people because at the end of the day, this is what it is all about; we work things out which we then pass on" (appendix C, p.70).

Resources spent vary among the researchers. Both researchers participating with speed-lectures had some material collected in advance and, besides from spending time on the logistics, time spent on the actual presentation amount to approximately two hours and two days, respectively. More resources were invested by the above-mentioned centre in preparing for the foyer activity. Posters were prepared and designed, materials were translated into national language and experiments and data collection were

organized in advance. Eight people from the centre furthermore participated in the event, and it is estimated that three weeks of work was allocated to the preparation and implementation of the activity.

Personal benefits achieved for researchers

In general, all researchers interviewed evaluate their participation in the event as a very positive and rewarding experience. For instance, one researcher mentions that it is beneficial and relevant to relate one's research to people's daily lives and that it allows for new perspectives on one's own work.

Another personal gain mentioned explicitly by two of the researchers was the experience that visitors were engaged and inquisitive –which resulted in interesting discussions– and that it was evident that visitors also gained something from these specific lectures.

Getting feedback about public response to research

None of the researchers received new knowledge as such with regards their research area, by interacting with the visitors. Nor did they purport to having learned anything new in particular about 'the public', as all researchers are experienced science communicators. On the other hand, it was confirmed that visitors in general are very interested in learning about science and curious about more obscure/difficult research material. Still, interacting with visitors and getting feedback to research did cause an impact in terms of obtaining new research perspectives and understandings as well as raise new questions.

For instance, one researcher mentions that a visitor contributed with an observation regarding a possible correlation between combating yeast infections and cancer, which gave rise to new research ideas for the researcher in question. Another researcher from the department of geoscience mentions that visitor questions made her think more concretely about how her own research can contribute to discussions regarding oil and gas and to a greater success with finding oil and gas fields.

Acquiring communication skills and using relevant expertise

Talking to laypeople about science is not perceived as a particularly difficult task for any of the researchers, and, again, communicating popular science is not foreign to any of them. Science communication, however, can bring about some challenges; for instance, one researcher mentions that preparing the lecture did give rise to considerations about the required academic level, since the event is designed to address a quite broad target group.

Furthermore, communicating abstruse research material vis-a-vis research topics, which are easier to relate to, involves different challenges and

degree of advocacy in terms of convincing visitors of research related opinions. The researcher representative from the centre for research on customer relations points out that while it is fairly easy to 'find a common language' when doing research on food choices and food related behavior, it can also pose a challenge since most people have very personal experiences within these areas, and she mentions in this regard that one would probably have to convince people about research on this area on a running basis.

As opposed to this, it is probably more difficult for people to relate to how basis research can entail new medicinal discoveries as another researcher points out. Still, he and the researcher from the department of geoscience both positively experienced that visitors acknowledged the purpose and valuable appliance of their research.

Participating in the science event has not added any noticeable science communication skills to the researchers' pre-existent competencies and expertise within this area. Furthermore, defining communication skills is not a straightforward task as two researchers point out, which also makes it difficult to determine any particular lack thereof, since the communication of science varies according to context, target groups etc.

These two researchers mention that you can probably always improve your communication skills and one of them explicitly states that increased knowledge on modern technologies (e.g. use of social media) could upgrade her skills in communicating science. However she also points out that disseminating science to people also is a basic matter of having to "accommodate to their situation or adapt to the respondents' way of thinking and sort of starting from that, rather than from your own perspective" (appendix C, p. 80).

The third researcher mentions lack of time as a noticeable, problematic factor for disseminating science. Therefore, he believes that science communication should be de-bureaucratized and that it is more 'learning by doing' than 'by training' as well as it is important to start early. Students, for example, might well be trained in the dissemination of popular science.

Career enhancement with regards to new networks/collaborations

Researchers' planning and implementation of speed-lectures and foyer activities took place in collaboration with the university communication department and for the centre for research on customer relations in the food sector; the planning was mostly carried out within the centre. Their event activity is part of a greater research project but it did not entail that any new contacts were made as this was not needed.

The researcher from the department of geo-science mentions that the contact with the organizers proved very useful in terms of establishing the specific research focus for her lecture in accordance with the main event theme. As regards further co-operation beyond the science event, she has been asked to participate with her lecture in a national TV-program; a program which combines lectures, debates and documentaries across the natural and social sciences and the humanities.

Furthermore, the researcher from the department of molecular biology and genetics plans to participate in another science communication activity (see section 2). Thus, for these researchers, this science event has resulted in new co-operations and activities beyond the event.

In brief, participation in the science event has had an impact for the interviewed researchers in terms of getting relevant feedback about public response to research. Event activities and interaction with visitors involved relevant and beneficial questions and discussions which led to new research perspectives and ideas. It was furthermore a positive and affirmative experience that visitors also benefited from the lectures and subsequent discussions and acknowledged the greater research objectives. With concern to career enhancement and acquiring new science communication skills, no noticeable effects were obtained, apart from possible new co-operations beyond the event.

However, it should be kept in mind that three researchers constitute a very small sample for delineating areas of impact; nonetheless, results are to some degree substantiated by organizers experiences and the feedback, they receive from participating researchers.

Impacts for the university as a science institution – institutional representatives

In the following, university's involvement in the science event will be delineated, and it will be assessed whether the event has affected the institution's visibility, competitiveness and increased the public acceptance of research, among other indicators.

University's involvement in the science event

The university became involved in the science event eight years ago when the minister of science at the time initiated a science dissemination project and invited all research institutions to take part. The university decided to participate, as the science event functioned well as a platform to communicate research to the outside world and thus helped fulfil the third university objective of dissemination of information, alongside its obligations in teaching and research.

Another motive for participating was the intent to accede to the demands of the public and honour their right to gain insight into the research, financed by tax payers. Resources spent on the event amount to 40.244,99€ in addition to staff charges. Most of the budget is used for marketing and promotion of the event. Around six employees have been involved in the event planning, among these in particular the project manager and, furthermore, colleagues and student helpers have assisted in setting up stands etc.

Impacts for the university as a science institution

In general, the event is –as mentioned– regarded to be a success among the public as well as within the institution, and the intention is to carry on with the science event at the university annually from here on out. As the project manager points out: “An influential success indicator of the arrangement is our choice to allocate resources to it year after year” (appendix C, p. 87).

The main objectives with the event are –according to the head of event and the project manager– to exhibit the research performed at the university to its surroundings and in this regard communicates research at an everyday level. Furthermore, it is a part of the university’s communication strategy to be a generous university which shares and communicates research to the broader public.

Main institutional benefits

According to the head of events, the main institutional benefits and impacts of the event run as follows:

“What we get out of it –and each researche– is a contact to the outside world (...)”This university profits by showing some of our activities to people, who are not regular visitors at the university. Because it is addressed for the broader public (...) Researchers have a chance to receive feedback to their current work, and they are actually given a lot of response” (...) And then of course, there is a general branding effect, which there also should be, in terms of showing some of our work and our wish to be open and inviting (Head of events, appendix C, p. 100).

Furthermore, the institutional representatives emphasize that participating in the science event has had an impact for researchers in terms of getting relevant feedback about public response to their research. This general perception is consistent with the statements of the interviewed researchers as well.

The institutional representatives also experience that the arrangement’s interdisciplinary approach to knowledge and research, can be of a great amount of benefit to researchers across different fields as well as a beneficiary way of “thinking cross-diagonally” for the university as an institution; the event, then,

has been a catalyst for new angles and perspectives and has provided a setting for sharing parts of the university's interdisciplinary aims and ambitions with the general public. Additionally, the event ties in with the university's intention to market itself as a generous university (see above).

Competitiveness

The institution's involvement in the science event has, in all probability, not done much to directly increase the competitiveness of the university. Neither researchers nor students have, in all probability, been recruited as a result of the festival. Nor is recruitment of students a stated intention with the event –if it was, a different approach would be preferable according to the head of events.

Thus, impact in this regard is difficult to document, however all institutional representatives emphasize a general branding effect as a result of the festival, and it is stressed that a lack of participation probably would cause a negative effect as regards the competitiveness of the university. Economic benefits are also difficult to verify, however the contact to the outside world could possibly pave the way for new collaborations, research project etc. which could enhance economic profits.

Prestige and visibility - public image

Another objective for the event is –according to the project manager– to heighten the visibility and public image of the university in the general public. While difficult to document, the event seems to bring with it certain definite branding benefits. Expanding on this, the project manager states: “I am certain it has great branding value in all sorts of ways to organize these types of arrangements and show visibility and not be elitist and closed. I am completely convinced about that” (project manager, appendix C, p. 85)

Additionally, the communication employee from the university's front office (see table 3.1.3) believes the marketing effect to be of greater impact than any possible visitor benefits such as increased science learning since she regards the total number of approximately 1000 visitors (fewer this year) to be a relatively low number if the broader public is to be reached.

Thus, she points out that if the objective with the event is to increase visibility and convey a will to communicate science, then the objective has been met, whereas the festival probably has had a minor impact with regards to the dissemination of research to the broader public. The relatively small number of visitors this year (around 500 according to our estimates, see section 3.2) substantiates this conclusion.

The declining number of visitors could –as mentioned by the project manager– be ascribed to this year's topic 'Europe', which may come off as a

more 'dry' subject than those of previous years. However, organizers did consider this possible consequence but decided that the general success of the event could endure this more specific topic, treading the ground for next years' topics of 'global challenges'.

The project manager furthermore points out that having a large number of visitors is not necessarily a criterion for success in itself, and that the contents of the science event do themselves constitute a qualitative criterion for success as well. Location (the department of mathematics), time of event (Friday afternoon) and lack of signposting could be other factors, which could help explain the relatively low number of visitors, however this is difficult to document and it remains suppositions.

Increased public accept of research areas

In general, the university does not have any problems with public acceptance of the institution as such or scientific work conducted at the university. According to the head of events, possible criticism concerns resource management (e.g. extent of tuition and research etc.) rather than the amount of financial support. He finds that the public accept has increased concurrently with increased visibility, for instance as a result of an increased number of students at the local university, which aims to disseminate research 'in an easily understandable way'.

The communication employee from the field of humanistic research furthermore states that the humanistic fields have benefited from arrangements such as this science event since the event render possible presentations of more untraditional research with alternative perspectives –research which she finds can be neglected by the media's more traditional form of science communication.

All institutional representatives' point to one possible negative consequence from the university's participation in the science event; that researchers face a dilemma between a wish to disseminate their research and still fulfil all of their other obligations, including other forms of science communication.

As stated by the head of events: "My greatest worry is actually that researchers find that the demand for them in all areas is too high" (appendix C, p. 103). Thus, any negative feedback from researchers has more to do with time-concerns than with the actual arrangement as such. Therefore, the organizers of the event try to help researchers as much as possible with practical issues etc. and hence maintain their motivation to participate in this science event.

Networking between actors

This year, the university has not collaborated with any external actors during preparation and implementation of the event. Due to a generally low amount of impact, the science event has had very little effect on the establishment of new cooperative bonds between the university and the private sector. Potential cooperation with other cultural institutions –which might allow for access to a wider target audience– is still in the works and may come to be useful for future science events at the university.

Conclusions

The main findings indicate that both visitors and central actors as researchers and institutional representatives in general are very satisfied with the event and that they regard the science event at the university to be a valuable science event both in terms of form and content.

Furthermore, results from the case study indicate that visitors find this type of interactive hands-on exhibitions as well as the opportunity for dialogue with researchers, a beneficial and interesting form of science communication. Thus, findings suggest that there is an educative value for visitors in terms of science learning. For instance, all five interviewed informants can, to some extent, relate the scientific contents exhibited and explained at the science event to their own everyday life.

The fact that visitors find the scientific content of personal relevance indicates that researchers were capable of disseminating scientific and technological issues in a tangible and comprehensible fashion, which facilitates visitors learning of key concepts and their engagement with science. However, when it comes to short-term impact on increased self-esteem and confidence as to discuss scientific issues, the science event has only had a relatively small impact in this regard.

The fact that more than half of the recurring visitors/respondents have searched for more information following their last visit/s indicates that the science event has had a small impact with regards to increasing visitors' interest in science and technology issues. Similar results are evident for increased confidence. For the two interviewed recurring visitors, the science event has not had any long-term impact as regards their scientific citizenship as they have not been more involved in S&T policy related events as a result of these visits and neither have they followed news stories about science and technology in the media more closely than they normally do.

However, both state that they will probably be more inclined to search for more information about nano-technology and health technology, respectively, as a result of their current visits. Visitors' more general perceptions of science and scientists by and large reflect an optimistic attitude towards science and technology issues, and there is general consensus that science is important and fundamental for societal progress. Interestingly, the picture is more diffusing with regards to trust in science and scientists, as well as whether scientists 'should listen more to what ordinary people think'.

The equivocation of these results complicates a clear analysis, however findings could point to the tendency that respondents on one hand have confidence in scientists and their expert advice and on the other hand also believe that scientists should be engaged in people's everyday life and not be closed up in an ivory tower.

Furthermore, judged by the statements of the interviewed visitors, it seems that visitors also prioritize ethical and moral matters when it comes to science; however their general attitudes towards science indicate that the possible benefits and trust in researchers complying with ethic regulations outweigh possible concerns about risks and misuse of research.

For the interviewed researchers, participating in this science event has had an impact in terms of getting relevant feedback about public response to research. Event activities and interaction with visitors furthermore involved relevant and beneficial questions and discussions which led to new research perspectives and ideas.

Additionally, it was a positive and affirmative experience that visitors also benefited from the lectures and subsequent discussions and acknowledged the greater objectives of the scientists' research. As regards career enhancement and acquiring new science communication skills, no noticeable effects were obtained apart from possibly a few new co-operations beyond the event.

For the university as an institution, main results suggest that the event seems to bring with it certain definite branding benefits and has helped increase the visibility and public image of the university in the general public. However, the relatively low number of visitors this year indicates that the event to a lesser extent has met the objective of disseminating research to the broader public.

Furthermore, the competitiveness of the university has probably not increased much due to the institution's involvement in the science event and neither researchers nor students have in all probability been recruited as a result of the festival. However, the event has been a catalyst for new research angles and perspectives and has provided a setting for sharing parts of the university's interdisciplinary aims and ambitions with the general public.

Recommendations

Recommendations for further similar science communication activities

As described above, the science event has several distinct statements of purpose; among the most central of these, is the aim of allowing for the university to exhibit and showcase its research to its surroundings and the general public, to reach a broader audience and to attract a higher number of visitors to the event itself.

Keeping this central purpose in mind, the interviewed visitors and institutional representatives have made several recommendations for this science event that may prove beneficial:

- In order to reach a broader audience, one might choose to hold future science events –or parts thereof– at a venue outside the university, or in cooperation with other cultural institutions; it has been suggested that certain activities related to the Festival could, for example, be held in the city square in downtown city. The idea to use venues outside of the university aligns well with recommendations made elsewhere.
- One could consider having the event at a time which would allow for a broader audience to visit and participate; beginning the event on a mid-Friday –as was the case this year– might well keep a rather large number of potential visitors from attending, as it coincides with their work schedules. One could potentially consider turning this science event into a weekend event, in order to accommodate for these conflicts of visitor schedules.
- In order to attract visitors from the upper secondary school demographic, the event could choose to once more allocate specific resources to this particular target audience. This would also serve to encourage more young people into science and allow for the festival to play a role as a potential catalyst for recruitment of future students.
- With regards to the actual logistics and organization of the various speed lectures, it has been recommended that they might well benefit from being extended a bit, so as to allow for a bit more topical depth; additionally, the lectures might well benefit from adding a certain amount of time at the end for debate, which would allow for a higher degree of audience involvement.

Particular recommendations about the use of selected instruments

In general, the selected instruments used for this case study (module A1, A2 and C1) have functioned well with regards to measuring impact within the two

dimensions: The public (individual citizens) and relevant actors (researchers and institutional representatives). With minor adaptations and omissions of certain questions in module A1 and A2 (see section 3.1. and 3.2), the modules proved beneficial for analysis within this specific local context. However, when it comes to the application of these specific modules for future use in equivalent case studies, it may prove beneficial to:

- As a means of achieving a higher degree of analytical explanatory force by means of method combination, an effort to strengthen the concurrence between questions in module A1 (Semi-structured interviews with visitors) and module A2 (standardized survey of visitors) might well have a noticeable effect. One question in module A1, for example, inquiries as to whether the scientific content of the event is of any particular, personal relevance to the visitor –this question, for example, could also occur in the A2 module.
- The analysis of the science event's personal impact on visitors –for instance with regards to learning of key concepts– could be strengthened significantly by including additional questions in module A2 about the educational value of the event.
- Both the interview guide for institutional representatives, as well as the interview guide for researchers, contain certain questions, the wording and content of which come off somewhat similar to other questions in the same guide; it might prove beneficial to reformat and edit the guides so as to keep the number of similar and overlapping questions at a minimum. In the interview guide for researchers, for example, the section covering “learning/getting feedback about public response to research” might reasonably be merged with the section covering “creating and using relevant expertise”, as the two address many of the same thematic elements.

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8. Here the author refers to a report on overview on scientific culture in the country where this case study was performed (2007). The name of this book has been suppressed in order to maintain the anonymity of this case report. If you need more information or wish to know more about it, please send a message to occ@upf.edu.

Internet links

9. Here the author refers to a several websites related with the city or the event where this case study was performed. The name of this book has been suppressed in order to maintain the anonymity of this case report. If you need more information or wish to know more about it, please send a message to occ@upf.edu.