Platform of Local Authorities and Communicators Engaged in Science

Modules used: A3, B2, C1

Science City

2012

This is a standardized version of the original case analysis number 26. Specific names and locations have been substituted from the original document number 26 with generic references in order to preserve the anonymity of every participant.

In case you would like to read the original document, please contact occ@upf.edu.

Index

Abstract

The city has the name of both a region and the main city. In the last few years, it has increased its relevance in Science and Technology due to organized strategies to promote research and develop new technologies. These strategies affect many fields, but particularly those related to the water supply (due to the drought problem of the region). The city is also home of a platform that encourages the transfer of knowledge between companies, named Science Park; and also receives some scientific events well-known at the region, with an important prestige for the region. Science and Technology Week and Biology Week (organised by a Foundation and the Faculty of Biology, respectively) are very popular in the whole region.

This case study is part of the impact assessment of science communication initiatives and policies (SCIP) carried out in the framework of the European project PLACES. In particular, this study case assesses the impact of a region, as a possible City of Scientific Culture, on three dimensions: public sphere (or citizens), policy sphere (or community and local dimension), and actors (people involved in SCIP).

The methods applied here were based on *The PLACES Toolkit for the Impact Assessment of Science Communication Initiatives and Policies,* with short modifications, such as the translation of the modules or its adaptation to the study. Three modules were used: Module A3 (Focus group with ordinary citizens, n=1, 9 people), module C1 (Semi-structured interviews with relevant actors, n=7). Apart of them, data from institutional sources of information were also analysed, this part was included as Module B2 (document analysis).

One of the main results of the present case study is that the city shows an strong activity in the field of scientific culture, as has been observed by analyzing the documents corresponding with the Regional Plan of RD, and the memories of a Foundation and the Science and Technology Week. Science Communication Initiatives and Policies (SCIP) carried out in the city are well appreciated by actors involved in them. Regular citizens also recognize and appreciate those SCIP.

This observation reinforces the affirmation about the adequacy to consider the city as a “city of scientific culture”. It is important to remember that, in contrast to what happened with citizens in the focus group, most actors interviewed had previously heard the concept of “city of scientific culture” and strongly agree on considering the city in those terms. Despite of this, we also have to remember that citizen first spontaneous rejection to this affirmation changed and the label of city of scientific culture was finally accepted by citizens

after they realized that they are capable of mentioning lot of organizations, infrastructures and research lines where the city is stronger than others, as well as numerous activities and actors involved in SCIP.

All actors involved in SCIP pointed out the benefits and impacts of a city of scientific culture on the citizens. Among them, they highlighted and gave data of the great impact of SCIP on the people, increasing vocations and media interest in science. These observations are supported by the results from focus groups and the document analysis. In particular, one encouraging result that would need further research showed a significant increase in the percentage of students attending scientific baccalaureates in a period of just three years time.

Regarding the effects of their personal implication in SCIP on actors, both at the interviews and the previous evaluation reviewed in this study told us that they agree on that the following are the main effects: motivation and satisfaction for the impact on public, learning, sharing and networking, other professional benefits (image, media attention, and visibility).

One of the particular features of the city as a city of scientific culture, is that its local dimension is very present in both research and SCIP. Local problems (like water supply, nautical needs, agriculture…) as well as local industry (food, furniture, marble…) have driven the development of certain areas of research an also the creation of particular infrastructures of science communication. An industrial and technological local history (submarine, helicopter, naval industry…) has also influenced the local character of the city as a city of scientific culture.

Introduction

The city takes the name of both the region and its main city. More than 500.000 inhabitants live in its metropolitan area. The entire region has a long-standing agricultural tradition and the warm climate makes it a highly suitable location for the cultivation of various crops and flowers.

Water has become a very hot topic in the region. Besides the large demand of water for agriculture purposes, the recent development of the tourist industry in the region has also increased the demand for such resource.

Since the present research belongs to a bigger work of impact assessment of science communication initiatives and policies (SCIP) that is carried out within the framework of the European project PLACES, one of the reasons to choose this region/city as a case of study was that it belongs to the network ERRIN, one of the main partners of PLACES. Moreover, the city has two other relevant features to be selected. First, it was considered interesting to analyze the impact from the city's recent commitment to invest in a wide range of strategies to promote research and development and foster the creation of new technologies. The key entities involved in this initiative are the regional government, the City Council, the local university and the regional polytechnic university. The city is home to a Science Park that encourages the exchange of knowledge and technology transfer between companies, universities and technological agents, promoting the creation and growth of innovative companies and providing spaces and facilities of high quality and value added services. While the city does not intend to become a global leader in technology innovation, it certainly does not want to fall behind. As part of the Plan for Science and Technology adopted in 2003, the Science Park is expected to contribute towards a new model for the region in the 21st century.

The second reason for selecting this city as an object of study is that it has a long tradition on science communication activities, some of them very popular. The most popular event celebrated in the city is the Science and Technology Week, promoted by the European Commission and organized by a local Foundation with the aim of showing science as an appealing reality, as well as presenting the people who work on it. Another interesting event is the Biology Week, with a noteworthy long history (25 annual editions at the time of our study). It is organized by the local university and it promotes vocations in Biology, showing the interest and practical possibilities of this field of science.

Methods

The methods applied in this case study were based on *The PLACES toolkit for Impact Assessment of Science Communication Initiatives and Policies*. The objective of this case study was to evaluate the impact of the region as a possible City of Scientific Culture, on three dimensions: public sphere, policy sphere (regional dimension) and actors. With this aim, three modules from the PLACES toolkit were chosen: a focus group with citizens (A3, n= 1 focus, 9 people), a series of semi-structured interviews with relevant actors (C1, n=7) and document analysis (B2) provided by institutional sources. The next table summarizes the dimensions analyzed and the modules chosen.

	Science Centres and Museums	**Science Events**	**Science Cities**
Public			*Focus group with (ordinary) citizens:* ***MODULE A3 (n=9)***
Policy Sphere			Document analysis: **MODULE B2**
Actors			*Semi-structured interviews with actors:* ***MODULE C1 (n=7)***

Table 1. Modules used for each dimension analysed.

It must be said that cooperation from the Foundation and researchers from the local university was very helpful. They provided us with all the information needed and facilitated a venue for interviews and focus group.

Document analysis

Data from institutional resources included content analysis of the websites of the foundation, the regional government, the local university and others. The foundation also provided the following internal documents:

- Annual memories from the Science and Technology Week (2007, 2008, 2009 and 2011)
- Annual Memories of the foundation (2008-2011)
- Science and Technology Plan for the Region (2011-2014)
- Internal documents with results from an evaluation study of the Science and Technology Week
- Global figures of baccalaureates. Data provided by the university and Science Policy Department from the Regional Government

Focus Group

Representatives from a partner university organised the focus group with volunteer citizens from the city. The outline used had been previously translated from English to the national language and adapted to the case studied. A moderator was present during the focus group to guide the conversation and encourage participants to speak, and an observer took notes from the session. The debate was recorded and subsequently their main points were transcribed. Nine people took part in this focus group. They represent different profiles in terms of age, gender, educational background and current job status: 5 women and 4 men. 6 hold a degree (Business Administration, Law, Geography and History and others) and 3 have a lower level of education. Two of them were older than 50 and the rest, between 25 and 50.

Interviewees

Interviewees were selected, first, according to the relevance of their knowledge for the case study, and second, to represent the different perspectives of actors as a possible city of scientific culture. The selection of the actors secures a broad representation, from journalist to researchers. Interviewees were selected as individuals who either had a long-standing history of participating in science communication activities (such as the Science Week) or who represented entities with a tradition on supporting science communication initiatives within the region. Interviews were conducted between February 20th and February 24th 2012. They were recorded and subsequently transcribed. To maintain some confidentiality of the interview partners, information and statements quoted in the following analysis are not specifically attributed to individual interview partners. Name and institutions of interviewees are listed on Annex 1.

	Code
	Government Representative
	Scientific Agency Representative
	Researcher and university professor
	Journalist
	Teacher
	Company Representative
	Science communicator

Table 2. Interviewees distribution (names of people and organisations in Annex 1)

Results

Results 1: Focus group with ordinary citizens (A3)

Responses are grouped below under the two themes presented in the PLACES guide for focus group with citizens. These are: perception about the notion of science city and influence of a science city on the citizens' everyday life.

Perception about the notion of the concept "science city" or "city of scientific culture"

No one has previously heard about the concept of a "Science City" or a "City of Scientific Culture" but, when asked of what could mean, diverse words came to their mind. First of all, they talked about the importance of *research*, *industry* and *research focused* (or *applied) to industry*. Some citizens also related this concept with *a particular area* of the city focused on science, or a *science park* where *universities and companies can collaborate*. The importance of a science museum in a science city is also mentioned.

Citizens pointed the name of some European cities and also a few from the country. A main city from the country was mentioned, what could be in part very logical because of its proximity but also because of the big science centre hosted in a modern infrastructure. Compared to those bigger cities, participants were aware of the situation of a small city like the one of the case study, since *infrastructure cannot be compared*. Finally, they complained about the situation of science and scientists in the whole country, which *makes researchers leave the country*.

They were also asked about other aspects connected with the concept of Science City. *Urbanism, infrastructures* and *transport* and their relationship with *ecology* were mentioned. Also a Scientific Park in contact with university:

> *A symbiosis between university and private company. The research in the company is also important. When someone finishes his/her degree, he/she should be more connected to the company.*

A debate was generated about the role of the university. Some of them said that *research is forgotten in universities*. Others disagreed and said that *universities are for teach and motivate research*.

> *Passion for research must be promoted since childhood.*

One person talked about a high school with an wide offer in science. All participants knew about this case and agreed with the idea that it is very important to start with young people and schools. They also agreed that building

big scientific infrastructures is not enough for such purpose, since people must also be interested in science before.

To create a technological city we must start from the people. We cannot create infrastructures if people are not interested.

Could the city be considered a "city of scientific culture"?

When they were asked whether the city could be considered a *"city of scientific culture"*, they rejected outright at the very first moment. Interestingly, after this first and spontaneous reaction, lots of examples and ideas came to their mind suggesting that maybe the city could be considered as a *"city of scientific culture"*. The following are some of the examples and values of the city, mentioned in by participants:

- They all agreed on the importance of the chemistry degree in the city

  People here study chemistry more than in other places. The faculty of chemistry is very old and important. Maybe such interest in chemistry is associated with vegetable garden.

- Citizens pointed out the importance of the research focused on water supply and agriculture technologies, because of the importance of agriculture in the region, and the problems associated with drought.

  Water consumption is very important here, people from Israel and the US came to check out the hydraulic issue.

- Just as they remembered more strong points (like water and innovation in furniture, in food industry or in agriculture…) a young girl got to an interesting conclusion.

  Everything here is related to the problems of the city. It's a bad idea to start researches foreign to society; they must be related to the demand.

- They also mentioned popular activities such as the Science Fair or the Science Week as examples of how the city motivates its citizens in this field. Other examples mentioned here were the "experiments" organized at local gardens, conferences organized by foundations and activities for small children like summer schools to learn about research and laboratories (with lots of requests).

- When asked about buildings, places or infrastructures, citizens mentioned universities. They said that museums are also important to catch the interest of the general public and they also talked about some other special symbols of the city that explain the past relationship with science and technology.

- They agree that industry in the city is also important in terms of scientific culture. They mentioned some companies in particular in the field of food, since they have advanced technologies on food conservation. They also explained that the city has potential in some areas, like the naval sector (maybe not like in the past, but it still is strong in this area), furniture, marble, etc.

- Finally, they commented the important role that hospitals play in research. Most participants agree that the city is strong in specific medical areas, such as organ transplantation and others.

At the end of these examples, participants seemed to agree that maybe the city could be considered as a true “city of scientific culture”.

When citizens were asked about how they got this information, they answered on the media and by word of mouth. They agreed that local media covered scientific advances very often (for instance, from the local hospital or from the Scientific Park).

Influence of a science city on the citizens’ everyday life

The citizens thought that living in a science city keeps up the educational level, but some remark that when talking about education *science is not all, culture is broader than science.* There was controversy here; some of them thought that *science is also broader.*

> *When we say “science” we think about engineers, but there is research in other fields as archaeology.*

> *Motivation, since school, family and society, must be in the environment. We should encourage the desire of self-improvement since the childhood.*

Next to this, they insisted on the necessity of seeing science as a broad activity.

Some of them thought that the city had a small cultural offer, but others disagreed, saying that there are theatres and activities. The problem could be the information availability.

> *The main problem is advertisement. Sometimes you learn about these activities once they have finished. And sometimes you have to search for them, because we have no cultural agenda.*

When they were asked if these activities influence their motivations, they firmly deny it.

> *No, on the contrary: your motivation influences the activities that you look for.*

Some of the people had said that *there isn't enough information about the activities*, but one of them disagreed.

> *We want everything in front of our eyes. A friend came and we went to the Tourist Office looking for information and activities. I was surprised about the information available, there were lots of activities.*

The moderator asked if scientific information was available at the Tourist Office, but they answer negatively: *only "cultural" activities are in this Office, not those considered "scientific".*

Citizens were then asked about how to include science museums or events in their weekend program. They said that if there was a bigger offer, they would go. They looked interested in these subjects.

> *They* [an observatory] *organize trekkings to see the sky when there is some special event like a meteor shower.*

At this point, they explained that the city, because of its kind weather, should need an outdoors museum. There are lots of activities outdoors, and they are very popular.

> *Here, any outdoors activity becomes quickly popular, we walk a lot and you can find it by chance even if you didn't know about it.*

Finally, they agreed on the statement about the professional choice. They think that science communication activities definitively help with the choice.

> *Yes, because if you see this kind of things since childhood, they can influence you. For example, a lot of people here play an instrument because of tradition, and with science could happen the same.*

Results 2: Semi-structured interviews with actors involved in SCIP

Responses to the questions are grouped below under the two parts indicated in the PLACES guide for semi-structured interviews: the interviewee's involvement in the case, and the impact on the interviewee. Each interviewee is quoted with a code name (Teacher 1, Researcher 2, etc.).

There are some interesting points that are largely shared between the interviewed and are worth noting:

- In contrast to the focus group, most actors interviewed had previously heard about the concept of "city of scientific culture" and strongly agreed on considering the city under those terms.

- They all pointed out the benefits and impacts of a city of scientific culture on the citizens. Among them, they highlighted and gave data of the great impact of SCIP on the people, increasing vocations and media interest in science.

- Regarding the effects of their personal implication in SCIP on themselves, they agreed that the following are the most important ones: motivation and satisfaction for the impact on public, learning, sharing and networking, other professional benefits (image, media attention, and visibility). For some, their participation in SCIP has opened doors to other sectors (for instance, the journalist now teaches science communication at the university).

- All of them are worried about the impact of the financial crisis on SCIP, but they are also optimistic talking about the future, because they think that all the actions carried out in the past years are changing the city and there will be people who will increase the value of the city as a city of scientific culture.

- They also wish that future SCIP could provide a bigger social repercussion of their activities and reach most of the society.

The interviewee's involvement in SCIP

The interviewees' position is quite varied, so their involvement in science communication activities also differs. Some of them work on initiatives to promote Science Culture in the city. Some others organise research innovation programs, research networking, research coordination, science communication and science journalism, organise events (such as the Week of Science)... The wide range of roles confirms the involvement of the city on science communication activities and policies.

The common answers when they were asked about the reason of their involvement in science communication issues were learning, sharing and professional benefits.

> *It is a big challenge. You learn, share, open your mind and it also gives you repercussion.* –Journalist–

> *To participate in this kind of activities gives meaning to the research work. It is an experience that transforms oneself and opens new work fields.*–Researcher–

> *Scientific knowledge must be public. Citizens have to understand the world they live in, and science culture is the first step.* –Science Agency Representative–

Concerning the investments required to participate, time and will are the most relevant. All of them have a big will against these issues, so time is the most decisive. Money is provided by a special programme.

We have an investment programme focused on scientific cultures of €1M. Events like Science Week are developed thanks to this programme. –Science Agency Representative–

It is interesting to note that the concepts Science Culture and City of Science Culture are not unknown for almost all the actors interviewed.

We use these concepts. In fact, there is a specific programme with these words. –Government Representative–

As far as I can see, this city is a science city. University and citizens are very close. The city shows and shares all the science that researchers do here. I think this city has an acceptable science culture. –Researcher–

Impact on the interviewee

Firstly, some of them pointed out that the scientific activities in the city have a great impact on the people, increasing vocations and media interest in science.

Media gives great importance to these issues in the city. –Government Representative–

It enriches the lives of all citizens. It is important to know your city and the work and activities that researchers like myself do here. –Researcher–

After this clarification, they started to mention the impacts that these activities have on themselves and, according to their words, it looked like science communication activities have great impacts on them.

Thanks to these activities, scientists are aware that communication is the first step for their social acceptance. –Scientific Agency Representative–

Each activity convinces me more about the necessity of promoting science culture, as soon as I see great results on students and public. –Government Representative–

When they were asked whether these activities make them learn new things, the answers were affirmative.

You always learn when you share scientific culture. – Researcher–

As a teacher, I could see research from colleagues, and alternatively or new applications for my own researches. –Researcher–

Language and communication skills are keys for any science event or activity.

In the Science Week we work with language adaptation. How to deal with it, how science journalist achieve it, associated problems… –Researcher–

Science communication is always a challenge, where rigor is fundamental. –Journalist–

Networking is another benefit from participation in science events, and brings the opportunity to meet new collaborators or start new projects.

It is a nice experience to learn about the work of my university colleagues and from other institutions. It definitively opens new work fields. –Researcher–

Participation on scientific events can impact deeply in actors and public. One of the actors interviewed is a teacher whose high school participated in the Science Week, and years later they started to organise their own science week. Now, this high school is popular due to their science activities and education.

The school had a radical change, and now is very demanded because of its science teaching. A few years ago we had 40 science students, now they are more than 90, and they could be more if we had more space. –Teacher–

One of them pointed how the city is above the country's average on innovation, although such average is quite low. This high innovation percentage can be one of the keys of the city as a Science City.

The city is way above the innovation average of the country. There are a lot of potential and innovation consolidated here. –Company Representative–

Finally, they were asked about the future of SCIP in the city. On one hand, they are pessimists because of the financial crisis, but on the other hand they think that there are great resources and people who will increase the value of the city as a Science City in the future.

Promoting science culture is capital, and politic disputes must be solved to improve this culture. Communication and coordination between parts is also very important. –Government Representative–

Apart from cutbacks there is a big will, and great resources. We can't stop working in this field. –Researcher–

I feel proud. We must be doing something right, because 5 years ago these things [more science students] *didn't happen* –Teacher–

Results 3: Document analysis and institutional resources

<u>The city as a city of scientific culture</u>

The city shows an strong activity in the field of scientific culture, as it has been observed analyzing the documents corresponding to the Regional Plan of RD, the memories of the foundation and the Science and Technology Week. Scientific Culture constitutes one of the main lines of action of this plan, and

includes numerous actions. Science Communication Initiatives and Policies (SCIP) carried out in the city are well appreciated by the actors involved, but citizens also recognize and appreciate those SCIP.

This observation reinforces the affirmation about the adequacy to consider the city as a “city of scientific culture”. It is important to remember that this statement was accepted universally by all actors interviewed, but citizens reacted differently. As mentioned before, citizens first and spontaneous reaction was of rejection. In their opinion, the city could not be considered of scientific culture. But this first reaction changed and the affirmation was finally accepted when they realized they were capable of mentioning a lot of organizations, infrastructures and research lines where the city has a certain expertise, as well of numerous activities and actors involved in SCIP.

Scientific vocations

During the scholar year 2008-2009, 43,72% of baccalaureate students in the city chose the scientific line. This percentage reached a 64,91% during the year 2010-2011 (percentages calculated from global baccalaureate data provided by universities and science policy Department from the regional government). That is, a difference of 21,5% percentage units in just 3 years.

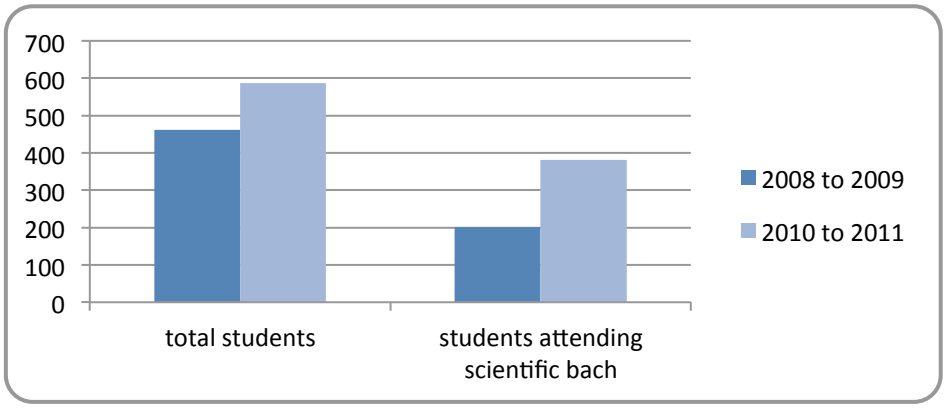

Figure 1. Students attending scientific baccalaureates in the city with respect to the total number of baccalaureate students. Differences from the curse 2008-2009 and 2010-2011

These figures are not used to demonstrate a causal association between a SCIP and an increase in scientific vocations, because apart from being more or less exposed to science through SCIP, there are many variables that influence this decision (family, school, etc.). The figures are here exposed because, at least, they are encouraging and it would be a good idea to monitor them for a longer period of time, and even to have a more sophisticated analysis trying to discriminate the corresponding influence of each potential variable.

Actors involved in SCIP and impact

Thanks again to the cooperation of the foundation, the row data and literal answers that a group of 27 organizations provided when they were invited to evaluate their experiences in the Science Week were available. This document will be used to compare data with the main results obtained through interviews and focus group.

First of all, the names of the organisations that have filled the questionnaire are observed to be similar to those mentioned by citizens (in the focus group) as the main players of scientific culture in the city. That is, citizens known quite well who the main actors are in the area of science and technology and SCIP. Moreover, their answers show how that the knowledge of local science and SCIP is transmitted by local media coverage and by word to mouth, showing the importance that local media can have on scientific culture.

From these questionnaires, it can also be observed that benefits from participating in a SCIP mentioned by this organization are the same that those identified from interviews with actors. They are mainly:

a) Increase of visibility (of science in general or specific centres or sectors)
b) Motivation for young people when choosing professional career
c) Impact on actors in terms of public recognition and professional opportunities.

> *Be more popular as an agency, publicize our services and staff in the preparation and organization of such an event.*
>
> *Disseminate science and technology to stimulate the growth of technology-based companies and promote entrepreneurship at an early age.*
>
> *Approach of research and society / better understanding of the work of researchers / understanding of scientific processes and applications / increase the interest of young people in research.*

Conclusions

The city shows a strong activity in the field of scientific culture, as has been observed analyzing the documents corresponding to the Regional Plan of RD, and the memories of the foundation and Science and Technology Week. Science Communication Initiatives and Policies (SCIP) carried out in the city are well appreciated by the actors involved, but regular citizens also recognize and appreciate those SCIP.

This observation reinforces the affirmation about the adequacy to consider the city as a “city of scientific culture”. It is important to remember that, in contrast to what happened with citizens during the focus group, the majority of interviewed actors had previously heard of the concept “city of scientific culture” and strongly agreed on considering the city in those terms. However, it has to be noted that citizens first spontaneous rejection to this affirmation changed and the label of city of scientific culture was finally accepted after they realized they were able to mention a lot of organizations, infrastructures and research lines the city is stronger than other regions, as well of numerous activities and actors involved in SCIP.

All actors involved in SCIP pointed out the benefits and impact of a city of scientific culture on the citizens. Among them, they highlighted and gave data of the great impact of SCIP on the people, increasing vocations and media interest in science. These observations were supported by the results from the focus group and the document analysis. In particular, one encouraging result that would need further research showed a significant increase in the percentage of students attending scientific baccalaureates in a period of just 3 years time.

Regarding the effects of the personal implication in SCIP on actors, both interviews and previous evaluation agreed on the main effects: motivation and satisfaction for the impact on public, learning, sharing and networking, other professional benefits (image, media attention, and visibility).

One of the particular features of the city as a city of scientific culture is that its local dimension is very present in both research and SCIP. Local problems (like water supply, nautical needs, agriculture) as well as local industry (food, furniture, marble) have driven the development of certain areas of research and the creation of particular infrastructures of science communication. An industrial and technological local history (submarine, helicopter, naval industry…) has also influenced the local character of the city as city of scientific culture.

Recommendations

Actors are worried about the impact of financial crisis on SCIP, but they are also optimistic talking about the future, because they think that all the actions carried out in past years are changing the city and that there will be people in the future who will increase the value of it as a city of scientific culture. They also wish that future SCIP could give a bigger social repercussion to their activities and reach most of the society. In order to minimise the effect of the financial crisis, it is recommended to adopt strong explicit measures about the role of SCIP in local and regional policies.

Along the same lines, the information available to citizens must be even greater than it is at the moment. Only if they know exactly the events and researches developed at their own city, they will be aware of the potential of such policies. Having done that, interest and enthusiasm will follow. Personalised and strategic actions of science communicators (journalist and communicators from different media, including online media too) could increase the promotion of these SCIP.

Because the emphasis at local dimension both in RD and in science communication is considered positive in this case study, other cities or regions should analyze if this model could benefit them as well.

References

1. De Semir et al. (2012) *The PLACES toolkit for the impact assessment of scince communication initiatives and policies*. Barcelona: Universitat Pompeu Fabra.