



Platform of Local Authorities and
Communicators Engaged in Science

Modules used: A3, B1, B2

Science City

2012

This is a standardised version of the original case analysis number 16. Specific names and locations have been substituted from the original document number 16 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.

Contents

Abstract	4
Introduction.....	5
Methods.....	8
Results	12
Conclusions.....	23
Recommendations	25
References	27

Abstract

A most interesting aspect of our knowledge society is to understand the places where science and society meet. For this reason, one of the main aims of the PLACES project is to identify dynamic models of cities of scientific culture. The research reported here has the aim to identify the consistence of a city as a city of scientific culture (CSC) building a map of its actors, places, and events in the light of the social, economic and cultural aspects of the local science communication activities and policies (SCIPs). The PLACES Impact Assessment Toolkit offered us the tools to develop the research. In order to efficiently collect and analyse our data, we used 3 methods: a desk analysis, based on formal and informal documents related to local SiS issues; in-depth interviews with relevant stakeholders (administrators, cultural managers, communicators, entrepreneurs) and two focus groups with teachers, explainers of the local science festival, and other citizens actively participating in the event.

The results clearly show an advanced development of local SCIPs: the city represents a model of a CSC based on a strong historical technical background, a successful SC event (the science festival), on the ground of important scientific institutions and a growing high-tech industry. The keys for the success of the city as a CSC are: the prolific collaboration between private and public funding of SC activities, the presence of a strong policy (not fully shared among stakeholders and citizens, however) and the approach used to involve both the public and the scientific community in the festival. The main weakness, on the other hand, is that the city is in an economic downturn, facing the global crisis and a slow industrial conversion. Local SCIPs can help face this decline.

Introduction

The aim of this research is to study the city of this case study as a city of scientific culture (CSC).

The study is part of the broader frame of the PLACES project, aimed to develop a model (or a range of models) of European Cities of Scientific Culture; the research is carried out within the PLACES project WP6, coordinated by the Universitat Pompeu Fabra.

The choice of the city is due to two main reasons: on one side, it is one of the PLACES city partners, already considered as “science city in progress” in the project’s documents (reference 5; 12); on the other side, one of the most successful science communication events in the country and in Europe takes place in the city: the local science festival. First held in 2003, the festival reached 226 000 visitors in its last edition (Autumn 2012), with around 500 explainers working on involving the public in more than 300 conferences, laboratories and exhibitions.

Once the object of the study had been identified, we had to clarify and take position on what CSC actually means and what makes it different from a “science city”, another usual way to call cities where the promotion of science is a priority. After reading papers and articles dedicated to exploring this concept (reference 5; 12; 4), while gathering the first documents on science communication activities in the city and before setting up the methodology of our work, we chose to favour the former term as a more suitable one than that of “science city”. In our view, a CSC better describes a place where scientific culture has a solid base in society and where the effort to achieve a “balance between elite science and public participation” (reference 2) is not just present but also well structured.

As anticipated, the city is one of the PLACES city partners, already classified as “Science City in Progression”, namely a city “that is developing a strategy to become a city/region of science”. (reference 12):

There [in the city] strategies are bottom up, supported by political leadership and characterized by a wide partnership. They face the problem of outward migration of the younger generation and the threat of lack of highly-skilled workforce for the regional companies.

Considering it as background, we will show how the city has all the characteristics of a full CSC, also in the light of the other measures taken by the

administration for a relaunching of the town and its PLACES Local Action Plan. We will take into consideration the main features that describe a CSC in the current debate on the PLACES Open Platform and apply them to our case. In doing this, we will remember the recent invitation by Richard Tuff, shared on this same platform, to keep the focus “on transferable lessons, not transferable solutions” (reference 13); thus, we will stress which are the current best practices as well as the obstacles to make of this city a possibly unique CSC.

In order to arrive to our result and obtain possible transferable lessons from this case, we considered the main elements at the base of a CSC, as the social, economic, political and scientific structures. They were explored starting from the tools offered by the PLACES Impact Assessment Toolkit (reference 5), where different dimensions and levels of research, as well as tools to carry out evaluation activities, are made available for the researchers.

In order to reach our particular goal, we decided to take the Political Sphere as the privileged area to be investigated. As suggested from the PLACES Toolkit, we took the in-depth interviews method as the optimal way to get information from relevant stakeholders. Besides, we investigated the concept of CSC with a different set of stakeholders in two focus groups, held during the science festival days (from the 29th of October to the 2nd of November of 2012). We were interested in the views of our selected participants in their role of privileged observers, in the perception and the evaluation of the city as a CSC. We wanted to understand what they thought about the impact of science communication initiatives and policies (SCIPs) in the town, what are the actors, the places, the events and the possible ideas to make the city a full CSC.

As a premise, we conducted an in-depth desk analysis where the geographical, historical, social and economic background is investigated. They constitute the framework for the IDIs and FGs results.

The city is located in the North-West of the country and is the chief town of its region. It grew around an important harbour. As we will analyse in depth in the following pages, the harbour plays an important role in the socio-economic life of the city and the whole region. The city developed a strong heavy industry during the industrial revolution in the 19th century. In the last two decades, it started to be replaced by high-tech industries. In these days the recent cultural policies and the restoration of the old harbour reinforced the tourism industry. Besides, the city is a place with a university of long tradition and with important scientific infrastructures as the national institute of technology and branches of the national council of research. Science and technology are not just produced there; they are communicated through one of the most important science communication events in

the country and Europe, the local science festival. The evolution of the festival, born from the wish of two foreseeing cultural managers (see Annex 1 for a tale by one of the founders), show all the features characterising a CSC: a strong motivation –in the case of this city, the need of improving public engagement to encourage young people to undertake scientific careers; an institutional place where science communication initiatives and policies (SCIPs) may be developed – namely the local administration at the time of the opening of the festival; a positive involvement of the local scientific community; the presence of a consistent public participation; (the important economic and touristy impact.)

On these bases and supposing that a CSC is representative as such during the whole year, and not only for the few days of an anyhow successful event, we investigated the social, economic and scientific issues at the base of the city as a possible 12-months-a-year CSC.

Methods

On the basis of the potential targets listed in the Political Sphere module and thanks to the advice of the local association for the science festival, which is the local institution affiliated with PLACES, we recruited a set of relevant stakeholders who actively participated in our research. We carried out the fieldwork in the period from the 29th of October to the 2nd of November of 2012, while the 10th edition of the science festival (SF from now on) was taking place. This gave us the chance to reach a wide range of interviewees and to collect quality data. The tools used were:

- Document analysis (module B2, see Annex 2 for the coding and analysis of documents)
- Individual semi-structured interviews (module B1, see Annex 3 for the translation to national language and adaptation of the guideline)
- Focus groups (module A3, see Annex 3 for the translation to national language and adaptation of the guideline).

In the period from the 29th of October to the 2nd of November of 2012, we conducted 11 semi-structured interviews (duration between 45 minutes to 1 hour) and two focus groups (lasting around 2 hours each). A detailed list of interviewees and participants at the FGs is available in Annex 4.

As regards the topics investigated through the in-depth interviews, we followed the interview guideline, namely:

- Impacts of the local policies regarding SCIPs
- Local social and economic impacts of SCIPs
- Possible SCIPs impacts on the citizens' quality of life
- Impacts on education.

During the interviews, the participants were requested to think, comment, and express their knowledge and ideas on the local SCIPs, aslo taking into account the future of these activities and policies in the city, with a particular emphasis on the status of the city as a CSC. We interviewed 11 stakeholders:

- 3 cultural managers
- 2 policy makers
- 1 entrepreneur (in the cultural industry)
- 1 director of a scientific institution
- 1 scientist
- 1 museum curator
- 1 communicator
- 1 teacher.

The interviews were held at the offices of the stakeholder involved, while the focus groups were carried out in the rooms of a Google-prized permanent laboratory of mathematics at a historical building.

As complementary documents helping to frame and enrich the interviews, we surfed the web to collect their curricula vitae when available; it helped to “place” the content of the interviews in a wider context and to read the results in a more complete way. As for the focus groups, the recruitment was crucially assisted by FG (responsible for the press office of the national research centre's local branch); CQ (association for the science festival) and MA (founder of the science festival and interviewee herself). Despite their busy time before and during the festival days, they personally took a first contact with most of the interviewees and suggested us the most suitable targets on the basis of their great experience in the territory. Despite the efforts in the recruitment, we were not able to reach any stakeholders in the industrial sector. Nevertheless, a wide range of data regarding this area was collected through the desk analysis.

As far as the focus groups are concerned, we followed the guideline of the PLACES Toolkit (Module A3), exploring:

- The general idea of a CSC, followed by its specific features.
- The features of the city as a CSC in comparison to an ideal one, including the symbols of the city in terms of scientific culture.
- The implications of living in a CSC as citizens and in the light of what was discussed about the city as a CSC.

Finally, regarding the document analysis, in the weeks before, during, and immediately after the fieldwork, we collected relevant documents through the Internet and from the interviewees themselves. We took into account:

- Documents Type 1 (those setting out plans, proposals and objectives for science in society/scientific culture initiatives and policies at the city or at the regional level): Transcription of the conference held during the science festival (October 30th 2012) to present three EU and/or locally funded projects relevant for this study (SmartCity, PLACES and CityLogo) to the citizenship.

Bylaws and websites of: CE (local culture industry); FAG (local culture industry); MUMA (local culture industry); Association for the science festival (local culture industry); the natural history museum; University of the city; commune of the city (administration); Province (administration); Region (administration); GF (civil society organization); civil society organization; LSSC (high school), national research council; national nuclear physics institute (scientific institutions); foundation of the national technology institute (scientific institution), GE (biomedical industry), CS (heavy industry).

- Documents Type 2 (those that present the results of previous evaluations of, or commentaries on, science in society/scientific culture initiatives and policies): local declaration on science and society (UNESCO, 1995), Regional Law 2/2007: Promotion, development, enhancement of research, innovation and university and high education activities.

Considering the PLACES Toolkit grid dimensions and levels of research (see table below), in order to research the city as a CSC, we covered two main publics: the “Public” and the Stakeholders representing the “Political Sphere”. Given the great importance of the science festival in leading the science communication activities in town, through the document analysis and the interviews with the stakeholders we covered the area of the “science events” as well.

	Science centres and museums	Science events	Science cities
Public			
Political Sphere (local/regional/cities)			
Actors			

Table 2. Dimensions and levels of research

In order to read through the wide range of data collected, we applied a simplified version of the discourse analysis (reference 7).

The structure of this report follows the pillars of CsSC as reported in the available literature (reference 12.), namely:

- Presence of important scientific infrastructures
- Presence of strong science communication activities
- Presence of local policies on science communication
- Economic aspects and funding of SCIPs
- Strong public participation.

Beyond the results, the successful collection of a wide and good quality range of data for this case study will give us the chance to perform further analyses: this work will continue in the next months with 2 or 3 master thesis by the students of the Master in Science Communication and Sustainable Innovation (MaCSIS) at a national university, who collaborated in this study.

Results

Scientific culture in the city: meanings and places

To describe a city of scientific culture, and to match a “real” city with this concept, it is necessary to consider its main features in terms of cultural heritage, size, economy, scientific infrastructures, local development policies, science communication (SC) activities and public participation. From the very first look at the fact sheet summarising the city’s main numbers and actors in terms of SCIPs (see Annex 1), it is clear that the city has many assets and potentialities in terms of scientific culture.

The city is a medium-sized town with a strong cultural and industrial heritage, with an important harbour used by more than 3 million people a year, a high expenditure rate for the development of cultural infrastructures [13.1 million in the 2007-2013 with the European Regional Development Fund (ERDF) programme], more than 63 000 students in the age 6-19, more than 6 700 teachers (from elementary to high schools), 13 600 students enrolled in scientific faculties (pharmacy, engineering, natural sciences and medicine, out of a total number of 35 200), a law addressing science-in-society instances (regional law 2/2007: Promotion, development, enhancement of research, innovation and university and high education activities). It hosts the National Institute of Technology and offices and laboratories of the main scientific national institutions. Its old harbour was restored in 1992, becoming an important centre also for science communication, based on the largest aquarium in Europe. Moreover, the city has a rich panorama of science museums and a forthcoming new science centre. The main sectors of industry are high-tech oriented.

The city is facing an economical downturn, though. Population decreased drastically in the last 20 years (from 816 872 in 1981 to 607 906 in 2011); the number of emigrants in 2011 was around 10 000, mainly in the most productive range of age (24-44); the industrial conversion is slow. In this negative landscape, two promising actors also in terms of science communication have been growing: the 400 000 square metres technological pole (called after the hill where it is planned and partially built), and tourism (in favour of which many policy and economic efforts were successfully made in the last 20 years).

The city is naturally in the current movement called degrowth. Workers and students escape. A promising actor is the technological pole (director of a scientific institution).

We come from a long technical tradition: here we built ships, airplanes, power plants and electronics; we have renowned engineering and scientific faculties. Besides, we have a still slow industrial conversion. After 20 years of being a kind of depository for empty containers, now a big scientific park is rising at the technological pole (research and cultural manager).

The history of the city is a solid basis for the scientific culture, starting from the big industries. There are many former workers of this company actively attending the festival (civil society organization).

The city is a very fascinating one, visited by travellers from all over the world since the very faraway past. Before the industrial revolution it was an art city, this image changed with the harbour development and the transformation into an industrial city. Now we need the contribution of the citizens in terms of ideas, above all from young people, to make this city a SmartCity in practice (the mayor during the presentation of the projects SmartCity and PLACES).

The concept of scientific culture is to be referred to the complexity of the city and its developments:

I try to explain the city as a CSC. The meaning of the scientific culture in a city depends also on its size. In general, a large university and relevant scientific institutions allow having a better link with high-tech companies and industries, which find R&D support on the territory. If a town has a cultural tradition, as this city has, then it is also easier that it puts greater attention to its scientific culture (director of a scientific institution).

Scientific culture belongs to our territory. It is in the DNA. In the last decades we underwent a true revolution and also the scientific education had to adapt to a new concept, far away from the industrial model of 20-25 years ago. The existing scientific community reshaped itself around the modern high-tech (policy maker).

The scientific culture changed the tourist side of this city, as shown by the place where we are now [the aquarium]. The bet made by the city administrators at the beginning of the years 2000 on the aquarium as a tourism resource was successful. The local economy is built on the high-tech industry, the harbour and the tourism. All these three elements are based on scientific culture (entrepreneur).

On the other side, the economic crisis makes the takeoff of the city as a full CSC slow and difficult:

Scientific culture is a value in itself, but it must not be a label for this city. It has to grow as a city of culture first. Science communication flourishes with economic, social and cultural development. That's a difficult process because of the precarious economic situation and the lack of businesses and investment. At the moment, it is difficult to propose the city as a CSC (communicator).

Last but not least, to involve the citizens in technological and scientific issues in a more effective way, the presence of a stronger network of stakeholders (policy makers, foundations, administrators, cultural and school managers) is needed:

A CSC is a place where science is produced and communicated and where there's a strong link between scientific production and industry (and) businesses, with a practical impact indeed. But without a network nothing is possible (cultural manager).

The main problem is to know about all the other science communication activities present in town besides the festival, which demonstrates that there's not a real network (teacher).

A stronger synergy among actors involved in SCIPs could be developed through a better collaboration out of the main SC event. A significant statement by an entrepreneur interviewed clarifies this main obstacle:

Something strange happens in this town: when the science festival is over, everything disappears. A real policy and promotion of scientific culture is missing. Even though many initiatives of science communication are present, and of excellent quality, coordination is missing. However, in the last years the first core of a network is taking shape...

Scientific infrastructures

To talk about scientific culture here in the city does not only have value but also meaning because the tradition in this respect is enormous. In this area, industries as M and A were born. They produced crucial innovations and innovative products. Now many things have changed and talking about scientific culture means projecting the future of the economic development. A symbol of this transformation is the technological park. The city must be seen as a city that talks about science to support technological advancements (policy maker).

Scientific infrastructures in the city are based on the already mentioned long tradition of heavy industry –which is converting now into high-tech and leaves its traces on the important harbour, the university and the branches of the main national scientific institutes. Thus, the city shows a rich landscape of scientific and technological infrastructures, to which we have to add the technological pole

(under construction) and the recent national institute of technology, an example of national scientific excellence which is still suffering from a lack of effective communication:

When the institute was founded, there were 100 people working there. Today there are 1200... The city doesn't know it yet. In the administration of the municipality there is still mistrust. They are not yet ready to accept the idea that the golden times of the steel industry can be substituted by high-tech. There is a cultural problem and a communication problem (scientist).

Finally, considered as a scientific infrastructure, a critical issue is the wireless coverage of the city:

Web 2.0... the current mayor, whom I voted, promised to have a complete coverage of the city with a wireless connection, which is not realized (scientist).

Local Science Communication Policies

Reading through the transcripts of the interviewees and the FGs, it soon became evident how the discussion around the local policies on SC is the most controversial. While there is a basic agreement about the present and future development of topics, actions and funding tools for science communication activities, talking about local policy produced different interpretations and judgements. Despite of the clear success of the science festival and the presence of a formal policy for the region, there is no agreement among the respondents on what a local SC policy is.

On one side, a policy on SC is interpreted as the making of the main SC event in town: the science festival. On another side, it seems the will by the policy makers to consider the topic of SC and consequently promote it; here, policy on SC is the awareness of the necessity to link science and society. Finally, it is a whole of decisions and actions formally addressed by a certain regulation.

Here we have the science festival, which is a multi-channel system that offers an opportunity to get closer to science at different levels by different publics, not just on TV and on the newspapers, but also through a direct relationship with the researchers. For them the festival is particularly important, since they learn to transfer their knowledge (cultural manager).

I believe there is no local policy on it. What is done is made on a voluntary basis. We organised science cafés to get the institute closer to the wider public but it is not a coordinated action. The Chamber of Commerce promotes it, since it considers science communication to be really important. In terms of policy, it is more relevant what a historical building is doing with the dissemination of the art in town. Instead, we don't

have a physical space where citizens usually go to discuss about science and technology, beyond the science festival (scientist).

I think policy is a cultural fact and now the economic crisis doesn't allow having a policy on SC. On the other side, the institute was born here and not somewhere else. There must be a reason. The science festival was born in the city and, even if it was not the result of a policy, the public administration supported it. In the future I would wish a better development, but the crisis will make us wait a little (communicator).

Except for the science festival, there are not other policies... Indeed, nothing to compare with other cities, where the science museum was able to build a true science communication system. With the festival, the public institutions started to be involved. What is in the city in terms of policies is thanks to the science festival (director of a scientific institute).

About SC policies expressed by formal regulation, the administration of the region enacted a regional law (No. 7, 2007 on promotion, development, enhancement of research, innovation and university and high education activities) establishing the "promotion of initiatives for connecting science and society". "Among our priorities", specifies a stakeholder interviewed at the R&D department of the region.

There is the scientific dissemination. There's a policy formally framed in the Law 2/2007 and a tool, namely the science festival.

Moreover, the region strongly supports the return of national scientists from abroad.

To have a big scientific community in town also means the possibility to communicate to the citizens the cultural importance of science and technology. This possibility is realized through the horizontal platform of the science festival. For us it means the possibility to communicate scientific topics at a regional level. I give you an example regarding energy. Nowadays our region hosts three carbon power stations. There's a complex debate about it. It has to be carried out on scientific bases in order to correctly communicate to the citizens. During the festival, energy producers have the chance to explain to and discuss with the citizens topics as the pollution deriving from these power stations. As administrators, we don't think of the industrial development as something linear, but in the view of a cultural development. The festival is the tool to reach this goal.

From another policy maker's point of view, the obstacles to realize an effective SC policy lie deeper:

I have to say that it is difficult to match the realization of an effective policy on science communication and the daily needs. Innovation has a cost also in terms of political effort. The administrative daily life suppresses many of the most innovative projects.

Of course we cannot state a definitive conclusion from our non-representative sample, and it is to be taken into consideration that we put a few questions on this topic along a complex one-hour interview, but, except for two policy makers, no other stakeholders mentioned the presence of a law addressing local SCIPs: it seems to be unknown, or at least not immediately present in the local stakeholders' mind.

However, beyond the different meanings of “local SC policies” assumed by the respondents, the basic lack of coordination did not seem to be a matter of controversy. Again, as for the other topics studied, SC policies come from individuals rather than networks:

Let's take the example of the historical building [see Annex 1 for a description]. It is led by somebody really capable: they organize amazing staff. But institutions don't talk to each other... (cultural manager)

I believe all the initiatives were born in a quite spontaneous way, starting from individuals who launched the idea, more than institutions. Likewise, the SmartCity project was not programmed but started by an individual who proposed it. Initially, SC was born separately from scientific institutions. An exception is the aquarium, which was born from an institutional policy (cultural manager).

Then, the brilliant results of the SC activities in town demonstrate that there is a strong policy on this topic but it is not always known and shared by the stakeholders, especially outside the period of the science festival:

Once the initiative started, we got incredibly good results and participation of all the different actors: the administration, the scientific community, the public (cultural and research manager).

Economic aspects and science communication funding

The economic crisis is obviously at the centre of the discourses around funding tools and actors (suppliers of funds). Two more original aspects regarding the economic aspects of SC in the city and investments in SCIPs are the scientific tourism development and the fruitful collaboration between private and public entities.

We have the examples of the aquarium and the museum, good working collaborations between the public and the private sectors. Usually, in what is a national tradition, we experience many examples where public funds are used by private parties in a very inefficient way. In the city we have examples of efficient public-private collaboration in the science communication field (research manager).

A foundation [see Annex 1] is now funding the new science centre. The owner is a businessman; he will fund the exhibitions with a view to obtain a profit (teacher).

The festival was started with 8 partners. Now we have 80 [see Annex 1]... we are funded by the region and the municipality, but 60% of our budget comes from private sponsors (research and cultural manager).

The Chamber of Commerce is always very attentive to SC issues (scientist).

Until 1992, the city didn't seem to be in tourists' maps. We reached 1 400 000 visitors per year at the aquarium. The city was not a tourist city; hotels only hosted managers and workers from the local industries. Starting in 1993, thanks to a policy dedicated to tourism, to the aquarium and to the restoration of some attractive buildings as the historical palace, this sector has come to represent 10% of the local income. This happened through science communication institutions such as the aquarium, the sea museum and the children's city. And of course, the science festival.

As regards the impacts of SC activities, the aquarium and the festival are the leaders. The aquarium's budget in 2011 was around 24 000 000 €; the festival involved 4 000 000 € in 2007, a figure reduced to half in 2012 because of the economic crisis. Both the festival and the aquarium feed an induced economy difficult to quantify but of clear relevance. They created new positions, temporary for the explainers of the festival (around 500 in the last edition, most of them students in different scientific faculties), and permanent for the aquarium. The latter employs 250 people and fostered the creation of new jobs, such as the technicians working in the building and maintaining the fish pools or the researchers responsible for the animals.

More generally, most of the respondents, both in the FGs and during the interviews, stressed the importance of structural economic policies. In this respect, the interviewees show a clear awareness of the role of SC as an aspect of the knowledge economy.

Science communication grows with the development of all the fields: social, economic, and cultural. It cannot exist without this development. I wouldn't call the city a city of scientific culture if not accompanied by a stronger industrial base and more investment (communicator).

Communication Activities, Media and Schools

As a city partner of PLACES, the city developed a Local City Plan based on a solid ground: from a first glance at Annex 1, where the main science communication

events and institutions are listed, the landscape of SC in the city appears wide and multifaceted.

In our PLACES Local City Plan we suggest that the technological park hosts a showroom for the industries and technical and scientific companies which settle on the hill. Another idea is that the park, as an incubator for start-up companies, should create an efficient competition. Before building this incubator, it is mandatory to create competition among innovative actors, an activity where science communication is strongly involved (founder of the festival).

It is also worth mentioning the museum activities which have been or are being developed, with the excellent example of the aquarium, the city of the children, the Antarctica museum, the sea museum, the port centre, where interactive tools show to the public how the harbour works. And of course the science festival, which is limited to ten days during the year and probably could do more, but is still able to attract a wide public also from outside the region; its bases are rooted in the scientific and industrial capabilities of the city.

The development of the city as a city of scientific culture must start with a regeneration process. The first step should be the natural history museum, which has one of the richest collections in the country but a poor look. We should seize the opportunity granted by the new Structural Fund Programme of the region to enlarge the museum and improve the quality of its valuable collections. Moreover, also in relation to the city potentialities, we have the greatest collection of medical tools in the world, coming from all possible places, which for the moment has no venue.

And then, WOW, the city science centre which will open next spring.

The last piece to complete the picture of the town as a city of scientific culture is "Abounding Science", which we propose to transform into a big laboratory. This comes from the fact that schools don't have the possibility to experiment very much because of the lack of laboratories. In this still free space, we could give the chance to the schools to have a space where they can perform experiments. We could also extend the activity of the science festival explainers and give them some work during the school year; they would help the teachers in the laboratory working with their students. The tools to fill this laboratory can come from a collaboration with the university, the national research centre, and many scientific institutions which could provide them almost for free.

We also have the European Academy of Scientific Explainers. We opened a branch in Shanghai, with the aim of giving young researchers the basics to communicate with the wider public.

In this complex map, we must include the already mentioned SmartCity project. This project shows particular attention to the use of SC as a policy-making tool to encourage young students to undertake scientific careers.

The main aim of SmartCity is to make this town a city of research. From the communication point of view, this would mean to build a space where local companies and industries can show to the citizens what they do. The communication opportunities are clear: think of the robotics developed by the institute, the tools to explore the inside of the human body and many other examples which are very communicative. This would bring a daily awareness of what's going on (policy maker).

A main obstacle to achieve an even more effective impact of SC on the citizen and the schools is to let them know the wide offer of possible activities:

A big company just arrived in town and opened its labs to the students, there are EU-funded projects as the Scientific Parliament and PON - "Touch the Science", a bioinformatics lab was recently opened to a high school, around 100 laboratories during the science festival... We should have a person working only on letting these activities be known (cultural manager).

People and citizens don't know any SC activities besides the festival (citizen).

Schools showed a high interest in the festival activity (they represent up to 60% of the public of the festival) and are strongly included in the local action plan.

Also, the local university is actively involved in the festival and recently hired a person in charge of the SC activities.

Finally, the media landscape seems to have improved in quality and quantity (presence of articles on the local newspapers, TV programmes) since the festival started, as a consequence of its rich programme, of the high presence of communicative and relevant guests and interesting topics, and the general development of science communication in the country (reference 1).

Impact of SCIPs and the Participation of the Public

The impact of SCIPs in the city has to be considered according to their targets: on one side, the impact on the stakeholders and, on the other, on the citizens.

As for the impact on the stakeholders, the science festival plays again a central role: since the success of the event was so big from its very beginning, stakeholders got increasingly interested and enthusiastic. That is also thanks to the way used to involve them. For example, in order to ensure the participation of the scientific community, researchers were involved through a call for proposals, using the same participation pattern as scientific conferences, and thus their same "language".

Moreover, projects as SmartCity, where networking and communication are essential to achieve its aims, foster a better link between the scientific community and the public administration, which is still one of the weakest points of the SCIPs in the city.

Inside the aquarium, we do science communication and researches, but researchers here are not taken as seriously as in academia. We collaborate with the university, but they don't consider us as they should, maybe because we are not a museum or maybe because we are a private entity (cultural manager).

As an example of SC targeted to the stakeholders, one of the first activities of the SmartCity association was to organise buses which took employees of the municipality to visit the institute. We discovered another world, an astonishing environment, truly international, young. It's a lively world, productive, creating wonderful inventions. It is up there, without any dialogue with the city. It grows independently from the citizens. Strictly from the SC point of view, beyond the festival there's almost nothing. There is still a huge separation among entities that could cooperate (policy maker).

Talking about a “dialogue with the city”, as far as the participation of the wider public is concerned, again the impact of the festival in terms of participants has been, and continues to be, definitely relevant. Also in terms of qualitative data, our results are clear in this respect:

The meaning of a scientific culture in the city is the creation of a favourable environment for innovation. Innovation has to be supported by citizens. The value of communication here is to involve the citizen, to make them take part in the innovation, and to make researchers communicate what they do. The feedback we had since the very beginning of the festival was extremely positive: local people fell in love with science (cultural and research manager).

On the other side:

There is an amazing participation in initiatives communicating hard sciences. That's thanks to the activity that started with the festival. However, I wonder whether the festival is really attended by a wider part of the population or if it is still visited by a mostly elitist niche (communicator).

As regards the present and future impacts of SC on the citizens, the local socio-demographic context raises potential interesting targets, while the most successful topics are energy and medicine:

The impact of a scientific communication can be useful to enlarge the horizons of young people. On the other side, in a city with a high percentage of elderly people, science communication can be very useful for this target (scientist).

Beyond the festival, everything that deals with daily life is successful. And so is environment and medicine (communicator).

Another interesting topic concerning the impact of the local SCIPs is one that is hard to estimate: it is not possible to outline a linear effect of initiatives and policies on the enrolments in scientific faculties. However, since the beginning of the festival 10 years ago, the number of students enrolled in chemistry and mathematics has increased (see Annex 1).

Conclusions

To understand the features characterising a CSC it is necessary to have a clear map of the actors, their connections, events and places where the SCIPs can be located. From a chronological perspective, it is necessary to understand the history of the city and its socio-cultural background.

Our results show how rich the city's scientific map is: important scientific institutions, a science communication event –the science festival– known all over Europe and in which citizens actively participate, the presence of a rich landscape of S&T-oriented museums and of institutions communicating the culture of the sea, from its natural and technical sides. All this within the framework of an outstanding history, very much linked to its harbour, and of its industrial and technological tradition. Different from many other national cities strongly marked by an artistic vocation, SC in the city seems to be more than just a minor sector of culture; it is embedded in the local cultural environment. Applying the parameters discussed in the PLACES forum to define what a CSC is, the city fully matches these features.

Still, the economic crisis and the slow industrial conversion are evidently the main obstacles for the already present –and considerable– local SCIPs. Through the desk analysis and the interviews/FGs conducted during this research, three main strategies to overcome the crisis stand out: the private and public investments in the high-tech industry (the technological pole under construction first), a tourism strongly based on S&T communication (aquarium, port centre, city of children, science festival and other relevant museums and institutions) and the already well funded SmartCity project, which is based on the concept of a knowledgeable society through a locally based strategy. Furthermore, from the economic side, we can report effective cases of collaboration between public and private entities to fund SCIPs as the aquarium and the science festival, the latter also considered as the main platform for the implementation of the regional policy on SC (regional law 7/2007).

Starting from the city's declaration on science and society, the document acquired by UNESCO to address SiS activities internationally in the early '90s, the city was able in these last two decades to translate its policies into effective SC activities. The extent to which they changed the public interest towards science and technology topics cannot be translated into a precise number (any data on the perception of S&T topics at a local level was unavailable), but surely the strong and active participation by the local people in the science festival in the last 10 years is

a clear sign of success (226 000 visits in the last edition). Schools are the main public (60%), pursuing the aim to encourage youngsters to undertake scientific careers; this matches the political and economic efforts to further develop the already established high-tech industry involving the local new generations.

Recommendations

Circulating knowledge

The city represents a model of city of scientific culture based on a strong SC event in the context of important scientific institutions and a growing high tech industry. In particular, going back to the initial purpose of this work –to outline a transferable lesson, the main successful keys are:

- The fruitful collaboration between private and public funding (aquarium, port centre, science festival)
- The presence of a strong policy (not fully shared yet)
- The approach used by the festival founders and organisers to involve both the public (innovating the SC landscape in the country) and the scientific community (this latter through calls for proposals).

Our research substantially confirms the consistence of the results of the PLACES survey “Obstacles to science communication policies”, the main critical areas being: resources (funding), coordination (interaction among local actors) and knowledge (of local policies). The main obstacle is evidently the lack of funds, rooted on the ongoing structural crisis, while improvable areas are that of a better knowledge/awareness of the policies and of the local S&T activities among the stakeholders and citizens. A better collaboration among these different actors would also mean a more effective use of what is already there, so as to further enrich the city as a CSC.

Features present today	Obstacles	Measures against the obstacles
<ul style="list-style-type: none"> • Excellence in science communication (science festival and aquarium, but also many other S&T forums such as a new opening science centre) • Strong scientific institutions (excellence of the scientific community) 	<ul style="list-style-type: none"> • Lack of funds • Lack of a strong network/lack of collaboration among stakeholders outside the science festival • Lack of public awareness of current S&T local development 	<ul style="list-style-type: none"> • Initiatives to strengthen the network of stakeholders involved in SCIPs outside the science festival (ongoing through the SmartCity project) • Better use of the present resources, in terms of <ul style="list-style-type: none"> ○ funding

<ul style="list-style-type: none"> • Examples of positive collaboration between public and private funds in fostering the local SCIPs • Strong public participation in cultural events • Presence of strong policies (from the city's declaration on science and society at an international level to the local legislative framework addressing "Initiatives of connection between science and society" (regional law 7/2007)) 	<ul style="list-style-type: none"> • Lack of knowledge/awareness on SC policies among stakeholders 	<ul style="list-style-type: none"> ○ locations for SC activities (ongoing through the city's PLACES LAP)
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------

References

1. Allansdottir A. and Veltri G., (2011). *Monitoring Policy and Research Activities on Science in Society in Europe (MASIS)*, National Report, Italy. http://www.masis.eu/files/reports/updated_fall_2011/MASIS_Italy_Report_updated.pdf
2. Charles D., (2012). *English Science Cities: A new phase in science-based urban strategy?*, in Ecsite Newsletter, 92:03. http://www.ecsite.eu/news_and_events/quarterly_newsletters.
3. Here the author refers to a collection of statistics of the city of the case study. 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.
4. De Semir et al., (2008). *Europe Science and the City: Promoting Scientific Culture at local level, Action Guide*. <http://recerca.upf.edu/escity/docs/ESCITY%20Action%20Guide.pdf>
5. De Semir et al. (2012) *The PLACES toolkit for the impact assessment of science communication initiatives and policies*. Barcelona: Universitat Pompeu Fabra.
6. Here the author refers to a book about the strategic future role of technology in the city of the case study. 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.
7. Fairclough, N., (2001). "Critical Discourse Analysis as a Method in Social Scientific Research", in Wodak, R. e Meyer, M., *Methods of Critical Discourse Analysis*, London: Sage.
8. Here the author refers to a report about innovation in the region of the country of the case study. 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.
9. PLACES survey, (2012). *Obstacles to science communication policies*.
10. Here the author refers to a book about science and society, values and

responsibility, and research and development in the country of the case study. 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.

11. Here the author refers to a book about the cultural and the structural funds in the country of the case study. 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.

12. Tuffs R., (2012) *Making sense of science cities*, in Ecsite Newsletter, 92:03.
http://www.ecsite.eu/news_and_events/quarterly_newsletters

13. Tuffs R. et al., (2012), Proto-models of cities of scientific culture,
http://www.openplaces.eu/sites/default/files/proto-models_report_errin_15_october_2012.pdf