

How can we turn a science exhibition on a really success outreach activity?

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Abstract

In April 2013, a CERN exhibition was shown in Santander: “The largest scientific instrument ever built”. Around the exhibition, were proposed several activities: guide tours for children, younger and adults, workshops, film projections... In this way, the exhibition was visited by more than two thousand persons. We must keep in mind that Santander is a small city and its population does not usually take part in outreach activity. With this contribution, we want to teach the way in which it is possible to take advantage of science exhibitions. It made possible to show the Large Hadron Collider at CERN experiment to the great majority of Santander population, and to awaken their interest in or enthusiasm for science.

Keywords: Outreach, science exhibition, enjoy with science, guided visits

1. Introduction

The present society is highly reliant on technological achievements. Transportation, communication, food, learning, even the way we interact with each other is changing at dramatic speed due to technological advances. This progress is made possible thanks to our deeper understanding of the laws of physics, mathematics and engineering among other disciplines, fields which also have experienced great progress in the last 100 years. The future is pulling for this direction and the basis of that future is the children of today's present. Because of this, it is of enormous importance for general public to get exposed to science and get them to appreciate as a motorlife of a high standard of life.

In this way, exhibitions offer us a great opportunity to show and provide science. In accordance with this idea, as Caulton (1998) said, “the growth of hands-on museums and science centres has been one of the most remarkable features of the leisure industry in the last decade, with almost every new exhibition proposal today incorporating an interactive element for visitors”.

Aware of the importance of all this, the Institute of Physics of Cantabria has carried out a great effort in order to bring to the city and profit science Exhibitions. We organize a set of different proposals around them, to enhance the potential learning from them, these events varies from guided tours for students and general public, talks, contexts, etc. These activities have always attracted a lot of people.

In April 2013, a CERN exhibition was shown in Santander: “The largest scientific instrument ever built”. A framework of activities as described above was set for it, and the exhibition was visited by more than two thousand persons, when usually this type of exhibition does not have more a few dozens of people. The objective of this work is to show how to profit from science exhibitions to a huge outreach event in a small city as ours. It made possible to show the Large Hadron Collider at CERN experiment to the great majority of Santander population, and to awaken their interest in or enthusiasm for science.

2. LHC: “The largest scientific instrument ever built”, an exhibition by CERN. General characteristics

At CERN, during the past few years, increasing efforts have been made to improve awareness in the general public of the importance of natural science to everyone. As a result of an increased awareness of the importance of outreach activities, many activities have been proposed, such as permanent and travelling exhibitions.

In this form, it was created the exhibition calling “LHC: the largest scientific event built”. This exhibition is a journey inside the largest scientific experiment ever constructed. It was an initiative of the European project Pathway, in which the Institute of Physics of Cantabria participated.

In Spain, the exhibition was organized by the National Center for Particle, Astroparticle and Nuclear Physics (CPAN). They coordinated it in this country (<http://www.i-cpan.es/expocern/>). Nevertheless, this exhibition was not limited to Spain, but took place across Europe.

This exhibition blends theatre, video and sound recreating a visit to the famous particle physics laboratory. It is composed by scenes to witness the uncovering of the Higgs boson, explore the 27-km collider and its cathedral-sized detector caverns. The exhibition allows to general public discover how studying the subatomic world can point the way to a fuller understanding of our universe. The exhibition explains, on one hand, how the Large Hadron Collider (LHC) works, an instrument located at the main office of the European Organization for Nuclear Research (CERN), in Switzerland.

2.1. *Characteristic of the Exhibition: LHC: “The largest scientific instrument ever built”, an exhibition by CERN*

In short, the exhibition covers the following aspects:

- Spanish participation in the largest particle physics laboratory
- CERN’s four experiments
- Main characteristic of CERN
- CERN’s basic research programs and their applications

The explanation comes complete with video projection and several different materials related to particle accelerators.

In terms of the technical features of the exhibition, the absolute minimum floor space required is 130 m². Ideally we should be looking at a minimum of 150 m², which allows to have additional material (objects/hardware) placed around the expo, if required. Also it enables visitors to move more freely.

The room should have an absolute minimum width of 8.00 metres. And about the minimum height requirement is 3.00 metres, but I prefer at least 3.20 m.

3. The exhibition in Cantabria region

3.1. *Cantabria region*

Firstly, it is important to make a stop and review some significant characteristic that we should keep in mind. Cantabria is a Spanish historical community with Santander as its capital city. According to the 2011 Census, the region has a population of more than five hundred thousand which constitutes 1.29% of the population of Spain. From a geographical point of view, it is a small region. Specifically, Santander has 177000 people with this number of 25202 kids.

Until recently, in Cantabria, general public was not very receptive to participate in outreach activities. For this reason, in order to change this, at IFCA (Institute of Physics of Cantabria), have been organized many activities for general public, covering practically every age, with different proposal and formats (master classes, workshops, talks, scientific cafes, guided tours, exhibitions, etc.)

3.2. *The exhibition in Santander*

On 4th April 2013, the exhibition “LHC: The largest scientific instrument ever built” was opened in Cantabria, specifically in Santander. It was exhibited for three weeks: from that day, 4th April, to 24th April. The exhibition was situated in a public library of Cantabria (Central Library of Cantabria - Biblioteca Central de Cantabria, <http://bcc.cantabria.es/>), a place of culture, with many users per day of all ages. It was for this reason because we chose the library as the perfect place to situate the exhibition. The public opening time was from 9 a.m. to 9 p.m, from Monday to Friday; by contrast, on Saturdays, the public opening time was from 9 a.m. to 2 p.m.

The exhibition was very successful: around 100 users visited the exhibition per day.

3.3. The awareness campaign

The awareness campaign was designed to ensure optimum community impact. This provides the opportunity to engage directly with members of community and influential community organizations. As previously was stressed, Santander is a small city and its population does not usually take part in outreach activity. For this reason it was so important the awareness campaign to attract people and make them part of the proposed project.

In this way, our awareness campaign covered the following aspects:

- It were designed a poster and folded sheet.
- Letters and e-mails were sent to school, institute, and several organizations
- Social networks were used and constantly updated.
- Press release were edited and published.
- Finally, we published the exhibitions and the proposal activities in cultural calendars at the city.

3.4. Activities

The exhibition was complemented by several activities proposed around it. They were the reason by it was visited by more than two thousand persons. Guided tours to the exhibitions and lectures were offered to groups of students, organizations and to the general public, respectively. Film projections were proposed too.

Guided visits

There is not doubt that daily guided visits were very successful. This would not have been possible without the collaboration of the researchers at the institution that work at CERN. All guided visits were done by them: more than 15 scientists were involved from the Particle Physics' researchers group at IFCA. In this form, daily guided visits were organized to schools and organizations. There was one or two visit per day all morning shift upon request. Moreover, there were free guided visits every days for general public all afternoon, without upon request. Through these guided visits, the exhibition was shown to more than one thousand five hundred people.

Lectures

There were organized five lectures for general public non specialist without have in account the

opening event, which took places on 4th April. The opening event was composed by a short lecture about the future of CERN. Teresa Rodrigo was the person in charge to this short lecture, where the research's future on Particle Physics, having in account the complex economic context and the crucial achievement that meant the discovery of the Higgs boson made by the LHC.

Here, a brief summary of the remaining lectures is shown:

- Lecture 1:
 - Title: "Why you should build the European Extremely Large Telescope, and why Spain has to participate"
 - Speaker: Xavier Barcons (IFCA)
 - Participants: 91
 - Date: 8th April 2013
- Lecture 2:
 - Title: "The formula that describes the world"
 - Speaker: Sven Heinemeyer (IFCA)
 - Participants: 73
 - Date: 16th April 2013
- Lecture 3:
 - Title: "We still do not know anything"
 - Speaker Jesús Marcos de Lucas (IFCA)
 - Participants: 86
 - Date: 18th April
- Lecture 4:
 - Title: "From CERN to society: Inventing for you"
 - Speaker: Iván Vila (IFCA)
 - Participants: 84
 - Date: 22th April
- Lecture 5:
 - Title: "Higgs Bosson"
 - Speaker: Alberto Casas (CSIC)
 - Participants: 120
 - Date: 23th April

3.5. Results

The exhibition made possible to show the Large Hadron Collider at CERN experiment to the great majority of Santander population, and to awaken their interest in or enthusiasm for science.

In this form, more than two thousand people visited the exhibition. In Figure 1, it is shown in a more detail way the number of participants per day.

TOTAL NUMBER OF PARTICIPANTS						
APRIL 2013						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1	2	3	4	5	6	7
			125	32	19	
				79		
8	9	10	11	12	13	14
54	50	86	54	38	22	
120	58	27	52	51		
15	16	17	18	19	20	21
56	64	46	69	112	23	
49	143	72	145	65		
22	23	24	25	26	27	28
47	53	44				
110	124					

Figure 1. Total Number of participants at the exhibition in Santander

4. Conclusions

Outreach activities offer the opportunity to see first-hand how science (including all areas) is part of their daily lives and not only what people do in inaccessible labs, while also learning to appreciate the benefits of supporting a scientific society. With these activities it is possible to show that basic research is important for the progress of the society and that it is a fundamental part of what being a human being means, starting at childhood for instance when they play, explore, ask questions, etc. Temporal science exhibitions are one of these kinds of activities.

Nevertheless, it is necessary to go deeper to attract people. One possibility is to organize activities around

exhibition in order to awake the interest of general public.

With this contribution, we want to help to take advantage of science exhibitions and teach the ways in which it is possible to awaken the interest of general public in or enthusiasm for science. In fact, the same idea was applied to the next exhibition about ESO, with approximately 2100 visits, also with the addition of context

References

- [1] Caulton T. (1998). Hands on exhibition. Managing interactive museums and Science Theatre. Routledge. London and New York