

Funny Science in the neighborhood

María Luján Castro

National University of the Centre, CIFICEN/CONICET, Tandil, Argentina

mlcastro@exa.unicen.edu.ar

Ana Laura Echegaray

National University of the Centre, Tandil, Argentina

echeanalaura@gmail.com

Marisol Martínez

National University of the Centre, Tandil, Argentina

martinezmarisole@gmail.com

Abstract

Funny Science in the neighborhood is a Program of the Science Faculty (UNCPBA-Argentina) in cooperation with the Municipality of Tandil. It is a temporary ‘hands-on’ exhibit that makes a tour for neighborhoods of the city, generating interest in science, among people of all ages and backgrounds, by the presentation of devices and demonstrations, mainly physics, carefully chosen to be entertaining as well as educative. At present it has almost 60 interactive modules with hands-on experiments; the work-team is integrated by scientists, teachers, technicians and students from the Faculty. Between 2012 and 2013, we carry out 14 exhibitions, with about 500 kids among others, in each one. In practiced, the exhibition is established for a week in each neighborhood. Previously we visit the place, connect and talk with teachers and neighborhood representatives, to gather information about the target audience, which is very broad in terms of ages and interests.

This presentation aims to communicate and share the experience gained over this time. The identification and analysis of the successes and weaknesses, allow us to infer strategies to improve and strengthen the action.

Introduction

“Have fun experimenting with science” (Divertite Experimentando) is a temporary interactive science exhibit created in Tandil in 2008 (1). It is an Extension Program of the Faculty of Science (National University of the Centre of Buenos Aires Province UNCPBA-Argentina) whose main object is generating interest in science, among people of all ages and backgrounds, by the presentation of devices and demonstrations, mainly physics, carefully chosen to be entertaining as well as educative. It has almost 50 interactive modules with hands-on experiments and the work-team is integrated by teachers, students and technicians from the Science Faculty. It intends to promote the diffusion and popularization of science and technology to the general public, but is primarily aimed to the students and teachers of the regional schools. “Have fun experimenting with science” is based on the premises of learning by doing, and contributes in filling children with enthusiasm for scientific discoveries.

In 2012, in cooperation with the Municipality of Tandil (Argentina), *Have fun experimenting with science* becomes itinerant and begins a tour for different neighborhoods of the city. The interactive exhibition as a “public space” is full of meaning, but it is essential develop strategies to broaden the spectrum of public and to include underserved communities, since their condition of vulnerability and exclusion, not naturally favors their assistance. It is thus necessary to conquer new scenarios, where the citizen lives, providing relevant information and making socially stimulating activities that encourage attendance, participation and ownership. The main aim of this itinerant exhibit is to contribute to empower critical and analytical thinking in people, mainly children, living in low-income neighborhoods, stimulating their creativity trough experimenting with Science. Learning about the methods employed by Science and Engineering, playing and solving problematic situations help to develop new analytical skills and give instruments to solve everyday problems. Besides, interest in science improves, while having fun!. Children are naturally curious and they seek problems to

solve. The science exhibit provides them opportunities to experiment while they are surprised and amazed. Our vision is to inspire and motivate children to achieve their full potential in the fields of science and technology, empower teachers and engage the community.

In this work we present the activities and the main conclusions obtained after covering 14 districts between 2012 and 2013.

Methodology

The call. In each neighborhood, the exhibition was set between 3 and 5 days in a suitable and available space and educational institutions in the area of influence were invited to visit and “make use” of it, as well as the institutions working with children, youth and adults (clubs, neighborhood workshops, etc.), and all residents of the neighborhood. It is mainly through the institutions that the majority of the call was made, allowing them to act as mediators between us and the potential visitors. The prior link with institutions allowed us to know their activities, their expectations, the reality of each area, and convey the project aims.

After the visit, the same audience becomes a promoter of the exhibit: children attending the school invite their parents, brothers, sisters and friends; teachers invite their colleagues; adult school students bring their children and grandparents who attend senior centers concur after with grandchildren.

Equipment and interactive space. The exhibition has about 60 interactive modules with hands-on experiments; all, or some of them, are selected for each presentation, responding to a conceptual route that adapts to the potential audience and the available place. The equipment is designed to be easy to move and built with materials easy to replace, cheap and safe, such as cardboard and plastic.

A selection criterion of the devices is their transparency (2), in order to facilitate observation, improve the identification of the variables involved in the processes and promote its reply, especially in the case of teachers, who leave the exhibition highly motivated and with many ideas to implement in their classrooms.

The interactive space is designed to be assembled in the available space in each neighborhood, taking into consideration the so-called visitors rights and barriers, cited by

Pedersoli and Alderoqui (3). Among the first are the comfort, sense of orientation, friendly welcome and sense of belonging, enjoyment and socialization, respect and communication, learning, choice and control the own performances, appropriate challenges to the possibilities of each, self esteem and the ability to experience smooth and pleasurable experiences. While among the latter, are the limitations for the intellectual, physical, emotional or sensory access; those relating to information, relationships and decision making, cultural and economic barriers. Thus, in the design of the exhibition, we seek to create pleasant and accessible places, with simple routes that allow visitors to move freely. Regarding physical accessibility, structures were adapt, tables improve with low heights or experiences arrange on floor for the smallest; placing chairs along the route for the oldest adults can sit and interact more comfortably with the experiences (Figure 1).



Figure 1

The visit. The path followed and the interaction with the devices are basically free; after the visitors are welcome, the guides orientate them for further action. They

mention and show situations that arouse conflict in the participants, as a tool to capture their attention, motivate and involve them in the situation. The purpose of these actions is to produce an environment for experimentation and discussion, encouraging participants to experience for themselves; these objectives are achieved in the most opportunities because the groups are small allowing an "almost personal" relationship with the visitors. Both counseling interventions and required explanations are tailored to the visitors knowledge, interests, time attention, which are highly dependent on the age. From a phenomenological point and through storytelling, in the case of younger children; with applications to everyday life for the middle-aged children and adults / seniors groups; more conceptual, with technological applications, in the case of adolescents and adults, etc..

Each presentation leads to an evaluation that enables modifications, adaptations. Taking into account concentration time of the groups according to age, the conceptual orientation and experiences that are most relevant, changes in the dynamics of presentation were done, adapting to the diversity of the audience: elderly, adults who attend primary and secondary schools, disabled school students and children under 6 years attending kindergarten. It is critical for these settings, the interaction with the leaders of the groups, teachers, professors and heads of establishments, group coordinators, etc..

Results and Discussion

Between 2012 and 2013, 14 neighborhoods in the city of Tandil including two rural sites were covered. More than 100 institutions were contacted. The target audience was very broad in terms of ages and interests. From schools, who took the sample as a trigger to formalize knowledge, to seniors who attended freely, as an instance of free learning. In total, between children, youth and adults, we were visited by more than 3500 people.

The sample showed great flexibility being able to adapt to different spaces and public, which was achieved thanks to previous recognition of space, the neighborhood, its institutions and interaction with neighborhood representatives; the pooling enabled the team to plan the adjustments which were considered appropriate. Visitors appropriated

spaces, mainly due to the knowledge of the selected physical spaces that are relatively close to their homes and institutions; the team of students and coordinating teachers were responsible for mediation, creating a relaxed environment, which favored visitor interaction. It was important to achieve the appropriation of themes, that the devices were built with known and accessible materials, a number of them could be replicated in homes or institutions, and the links between devices and experiences with phenomenon involved in daily life, responding to the particularities of each social context.

The enjoyable, simple and affectionate treatment afforded by the guides; seeking dialogue, listening to participants, assistance and valuing their opinions were highly recognized and relevant factors.

Conclusion

Between 2012 and 2013, we carry out the project Funny Science in the Neighborhood. Fourteen neighborhoods in the city of Tandil, including two rural areas, were covered; more than 100 institutions were contacted and over than 3500 people visit the interactive science exhibition. Regarding the performance of the visitors, the proposal was very well accepted, which strongly enhances with self-confidence increases, producing a high degree of satisfaction, evidenced in attitudes, gestures, comments, smiles and joy!

The learning of the team that organizes and collaborates on Fun Science in the Neighborhood was very important; detecting the strengths and weaknesses, but mainly all the work gave confidence to continue with it, improving in future editions.

Scientists, guides, students and kids, teachers, visitors in general, interact while learn and have fun. A network was built between us and science teachers from the schools in order to plan future exhibits and support them with inquires.

Acknowledgment

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References

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