Public Policies for Science Popularization in Brazil: 10 Years of the National Science and Technology Week

Leda Sampson
Ministry of Science, Technology and Innovation
leda.pinto@mct.gov.br

Abstract

The public policies for science popularization in Brazil, although recently introduced in the country, are beginning to show very positive results. These results can be studied under different aspects and their impact is visible not only in the growing number of activities and events that happen each year, but also in terms of public engagement, recognition from the government and academic valuation of science popularization. Since the major tool available today to undertake the difficult task of establishing a scientific culture in the country is the National Science and Technology Week, this paper presents its history, its role in the promotion of social inclusion, its contribution to the development of a scientific literate population and to the appearance of new initiatives, and the perspectives for the future of science popularization in Brazil. After ten years of solid efforts the Brazilian population is beginning to understand the importance of science and technology for their lives and for the development of the country.

Introduction

It was ten years ago that the concept of science popularization was firstly introduced in the Brazilian public policy agenda. Since then the scenario has changed greatly, from a country where government support to science popularization was restricted to eventual calls for the creation of new science museums or isolated actions to strengthen science education in schools to a country where millions of people engage in scientific activities every year and millions are invested in science popularization programs.

Today the Brazilian government is concerned about the attitudes of Brazilians towards science and technology and recognizes the need to promote a closer contact of citizens with the science they experience in their everyday lives as well as the science produced in the country. The great majority of these efforts are concentrated in the National Science and Technology Week, an event that happens yearly in every state and in about 12% of Brazilian cities, and has become the reference for science popularization activities in Brazil.

The National Science and Technology Week

The National Science and Technology Week (henceforth "The Week") was established in 2004, by means of a presidential decree. In ten years The Week has become the major scientific event in the country and is today the largest in the world in terms of territorial expansion. Since its first edition, the number of cities participating has increased from 252 to 742, and the number of registered activities has jumped from 1,842 to 33,749. All kinds of science popularization activities are welcome, and partnerships among local actors are highly encouraged.

Besides being a tool for science popularization, The Week plays an important socio-political role as it calls people to provide feedback to the government as to what their most pressing needs are and what they expect for the future. This is achieved by proposing different themes each year, and stimulating discussions about these themes. The more people understand and participate, the more socially included they feel and the more benefits they obtain from the developments of science and technology.

The chosen themes usually address important issues or celebrate scientific dates or achievements. "Sky"; "Water"; "Creativity and Innovation"; "Earth"; "Evolution and Diversity"; "Science in Brazil"; "Science and Sustainable Development"; "Climate Change, Natural Disasters and Prevention of Risks"; "Sustainability, Green Economy and Eradication of Poverty"; and "Science, Health and Sport" were the themes in the past 10 years and reflect the preoccupation to select subjects that relate to the population and to the Brazilian reality. During this period were also celebrated the International Year of Physics, the 100th anniversary of "14 Bis", the International Year of Planet Earth, the 150th anniversary of the Theory of Evolution by Natural Selection, the International Year of Astronomy, the International Year of Biodiversity, and the International Year of

Chemistry. In 2014 the theme is "Science and Technology for Social Development", another subject of great relevance to the population.

Although it is difficult to have an exact account of the attending public, it is clear that the participation is intense, especially in activities organized by more than one institution and that take place in public spaces. The level of engagement, the quality and the impact of the activities are even more difficult to quantify. However, especially for children and teenagers, the motivational character of these actions is clearly visible to those who visit science tents or public events. Overall, it is likely that on its own The Week has reached over 10 million Brazilians in its 10 years of existence, which accounts for about 5% of the population. However, this figure is heavily underestimated if one considers the number of new initiatives, projects, activities and events that owe their existence to the invigorating scientific environment that emanates from The Week every year.

Results and Impacts

Historically, major decisions about the directions of scientific development have been made by scientists, governments and corporate interests [1], and these decisions not always reflect the interests of the poor and promote the well-being of all. The understanding of scientific issues allows the population to develop a critical view of the world and society they live in, breeding the desire to participate in the political decisions that may alter their future and help decide the direction of scientific developments. Therefore, to become an autonomous individual and a participative citizen it is necessary to be scientific and technologically literate [2]. Besides, the governance of science involves questions of ethics and values as well as 'facts', so it seems appropriate for the voting public to play its part in the decision-making process [3].

In this context, non-formal education plays a very important role for the permanent formation of individuals and for the increase in collective interest for science, technology and innovation. Informal events for science learning stimulate science interest, build learner's scientific knowledge and skill and help people learn to be more comfortable and confident in their relationship with science [4]. Popularization of science also generates an appreciation of the positive outcomes of science and technology [5] and generates social inclusion.

In Brazil the deficiency of science education in schools enhances the need for non-formal science popularization initiatives. However, as a country with 26 states and a Federal District, all quite distinct in terms of size, geography, environment, culture, history, and socioeconomic development, the challenge of any large-scale program of science popularization is to act differentially in each estate, taking into account all the diversity and the peculiarities of the local institutional/political arrangements, demographic distribution and largely divergent levels of interest from the general public, students, scientists, and the local administration.

The Week has appeared to meet this challenge, sponsoring widespread interactive activities without a suggested methodology. The Week can thus be characterized by a nonexistent set of rules or fixed mechanisms for its implementation, which allows science to be disseminated with versatility, dynamism and democracy. Given this freedom, activities are remodeled every year and each local organizing committee has autonomy to adapt to the newest tendencies, concepts and developments of the field.

Due to this flexibility each participating state or city has developed its own model for The Week, according to the local reality and naturally taking into account the huge contrasts that exist in Brazil. In the North Region activities generally involve discussions, debates, workshops and scientific talks about the Amazon Forest and how to preserve and use its resources in a sustainable manner; in the Northeast Region, which has a history of continuous and very grave drought periods that cause a great deal of suffering to the population, activities have involved debates concerning actions that should be taken by the government to prevent and mitigate the situation – these kinds of activities increase the awareness of the population about a problem they experience in a daily basis, and stress how science and technology can be used to improve their lives, qualifying citizens to demand actions from the government; in the South Region, where the production of wine is one of the main economic activities, there have been debates about the cultivation of grapes, the science of wine making and how technology can boost local development. It has been reported that popular participation is much more intense when the proposed activities deal with situations they understand and relate to, as suggested by the contextual model [6].

This decentralization maximizes the learning potential of any individual, especially those who have never had access to scientific knowledge, since it introduces

science and/or scientific concepts in a simple and straightforward manner, relating theory and practice, thus forging a connection between science and the daily life of that particular individual.

Due to its appeal, The Week has progressively lost its status as an event promoted by the federal administration and has become a major science popularization program appropriated by states, cities, institutions, scientists and the general public. It has changed from a side activity to the main event guiding science popularization practices and congregating a series of integrated actions that successfully reach and engage people all over the country.

Each year local organizations involve more people and institutions, forging a stronger partnership between city and state governments, universities, research institutions, scientific agencies, armed forces and private companies. These partnerships induce joint efforts that are very beneficial to the population in the long run, for they encourage these actors to work together yearlong to solve problems and promote local development. It is clear that the more partners involved the better the results and stronger the impact of The Week in that city or state. Another good practice that has been followed is the direct involvement of schools, with preparatory meetings that happen early in the year and encourage wide participation. As a result of these efforts a large number of schools have included The Week as an annual event in their calendar.

Over the past 10 years universities, research institutions and scientists have become increasingly involved in The Week, and what was once the isolated participation of a few professors/scientists has turned into the involvement of the entire institution. Hence, the historical gap that has always existed between the population and the university is declining. By means of open doors events, promotion of scientific talks and debates, cultural events, fairs, and many other activities universities present themselves as part of the community and invite the population, especially youngsters, to get to know academic life. It has been reported that closer contact with high school students has increased the number of applications and has given a new perspective for those who once thought the university was out of bounds. This result is extremely relevant when one considers that these activities are actively generating social inclusion.

Furthermore, universities now take their social role more seriously and during The Week extend their activities to local schools, offering workshops and short training

courses to science teachers, producing material to be used in science classes, and sending scientists and students to give science talks to children.

Another very representative result has been the establishment of State or Municipal Science and Technology Weeks in many states and cities. Wherever this is the case students, teachers and the society are constantly stimulated to discuss relevant issues, which facilitates the learning process and strengthens their scientific attitude. This demonstrates that administrators now understand the importance of science popularization for their community and for the improvement of science education in their schools. This is a direct consequence of popular engagement and pressure. In some states The Week has mobilized the civil society to demand more investments in science and science popularization from their local governments, which resulted in the creation of local Secretariats of Science and Technology and of new funding agencies.

In ten years the country has seen the rise of a great deal of diversity in proposed models for The Week, where the activities developed and the manner in which they are carried out are closely related to the many Brazilian realities, socially including people who have been historically neglected. The use of various kinds of technologies has permitted the participation of over 40,000 indigenous students living isolated deep inside forest regions, projects developed in communities with high levels of criminality have given new perspectives to oppressed individuals, projects that bring science to the countryside have turned otherwise excluded villages into important focal points to spread activities inwards, the creation of mascots and individualized brands have given states and cities their own personalized Week.

An evaluation of these results from a national point of view seems to indicate a clear change in the general scientific attitude of the Brazilian population. This assumption has been confirmed by surveys of public perception of science and technology, conducted in 2006 and 2010. In 4 years the visitation to museums/science centers or participation in any kind of scientific/technological activity increased from about 4% to 8% of the Brazilian adults (from 5.6 million to 12 million), meaning that the public policies for science popularization are beginning to show results. This same survey is being conducted in 2014 and the historical comparison of the three will allow a comprehensive study and critical analysis of the evolution of Brazilian’s attitudes towards science.

The future of Science Popularization in Brazil

Since its first edition The Week has grown to be a very successful tool not only to disseminate science throughout the country, but also to contextualize science according to the distinct cultural, socioeconomic and geographic aspects of the Brazilian population. The large-scale mobilization it generates yearly and the increasing participation of the general public, institutions, academia and the government demonstrate that its reach goes beyond the average citizen, engaging all sectors of the Brazilian society.

The significant increase in the participation of the academic sector should be highlighted, for it shows that The Week is promoting a pronounced growth in general awareness regarding the importance of science popularization. Funding agencies now recognize and value professional experiences in the field. It has been argued in the literature that in order to engage in science popularization activities, scientists need recognition from their institutions [7]. In that case, Brazil is in the right path.

A simple analysis of the evolution of science popularization actions in the country since 2004 indicates that the current programs and actions for science popularization are now well established. The Week has become a national event to which the population relates and to which governments and institutions are drawn. However, there are still great challenges to overcome. It is clear that the increase in public investments brought about by the success of The Week has started and strengthened many other initiatives but their effect in the creation of a scientific culture and promotion of social inclusion is still rather slow and of difficult measure.

In order to produce faster and more measurable effects there has to be a new course of action, a new approach to reverse the old reasoning of the deficit model [6] where science popularization is simply a means to bring science to the scientifically illiterate general public. Brazil is a complex country and science popularization in Brazil must deal with aspects that reflect this complexity. There are problems faced by the society as a whole, which cannot be promptly solved, but there are very specific problems faced by very specific communities that can be easily solved by means of science and technology. Thus, science popularization should also be viewed as a tool to bring these problems to universities, scientists and governments and as a tool to compel these actors to take action, regardless of their interests or fields of expertise.

Furthermore, the reach of science popularization activities in the country is far from ideal. The number of cities, villages and communities that do not participate is still too high, meaning that for these particular people these actions do not exist or, if they do, they are not appealing. The experience of The Week has shown that the more vulnerable a certain group of people is the less they participate in scientific activities or visit science museums, not because of a lack of opportunities but because they do not think themselves worthy of it. The paradigm must change not only by offering more opportunities, but also by changing how people see themselves and what people think of themselves.

In this scenario, it is strategic to link science popularization to social public policies such as Social Technologies, Local Productive Arrangements, Solidarity Economy, Technologies for Disabled People, Food Security, Sustainable Development, among others. By joining efforts it is possible to use science and technology as a much more effective means of life and self-image improvements, as well as a means of strengthening science education in schools, of offering the population a critical view of the world and society they live in, of enhancing their feeling of participation and citizenship and of generating a collective appreciation of science and scientific results.

The current National Strategy for Science and Technology 2012-2015 and the National Plan 2012-2015 are at an end. It is time to rethink all national social inclusion strategies, perhaps changing from a generalist approach to a more specific one. Bringing together tools and policies that can be of much more value if put to practice together than if applied on their own is certainly the way to go.

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