

**Development of public policy on science-technology popularization:
a method and its application in Mexico**

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Abstract

There have been various efforts to design and implement public policies to communicate science and technology in several countries. In Mexico, initiatives have been proposed but few have been materialized. A pioneering initiative was successfully implemented in the State of Michoacán, with the support of the local executive and legislative authorities: the State Program of Diffusion and Popularization of Science and Technology (PEDDCyT), which is comprised of three components:

(1) A systemic diagnosis of science-technology popularization, which included an analysis of the environment in which S&T popularization occurs in Michoacán, an inventory of the activities and resources of S&T popularization in the state, and a SOWT analysis of S&T popularization; (2) A set of public policies on S&T popularization, along with their respective lines of action; (3) A strategic plan of popularization of S&T, which included a prospective component (mission, vision, general objectives), a strategic component (SWOT analysis, strategy, mid-term strategic projects portfolio aimed to strengthen S&T popularization), and a tactical component (set of short-term operational programs and development projects of public communication of science and technology).

The process of formulating the PEDDCyT --which included public policies as a core component-- was marked by a very wide participation of the Michoacán's S&T popularization community, which generated a product of shared visions, experiences, and aspirations. On the other hand, a proprietary method involving various data collection strategies was developed.

This groundbreaking case is encouraging efforts of the same nature in other Mexican states, as well as in a Latin American country.

The development of public policies to strengthen social communication of science and technology has been considered by many science communicators as a factor that can have a strong impact in promoting social appropriation of science and technology. This is particularly relevant, considering that in many countries various government agencies have created programs to communicate science and technology; or that many programs in this field are largely supported by government funds.

In this context, there have been various efforts to design and implement public policies to communicate science and technology in several countries. In Mexico, several initiatives have been proposed but few have been materialized. One example would be a pioneering initiative that was developed and implemented with the support of the local executive and legislative authorities in the State of Michoacán, despite the fact that it is one of the lesser developed states in terms of education and scientific and technological progress.

This groundbreaking case, carried out with a broad participation of the local community of science communicators, and with a solid ad-hoc method, is already a reference and an example to encourage efforts of the same nature in other Mexican states, as well as in other Latin American countries.

Public Policy

Public policy is a crucial variable in the development of any society.

It is the responsibility of any State to ensure –through the establishment and implementation of public policies in various fields—that the institutions effectively promote equitable benefits for all sectors of society, in face of existing conditions and/or what is desirable to achieve in the future, with regard to social needs or to a predefined prospective.

A public policy is basically a postulate which states a position and / or a selected course of action in response to aspirations, needs and problems of a society, in a context of relevance and legitimacy.

Therefore, public policies –on science communication or any other subject— should emerge from a process where these aspirations, needs and social problems are addressed; and to which an appropriate political and strategic design is produced.

According to Kraft and Furlong [public policies] reflect not only the most important values of a society; but also conflict between values. Policies clarify to which of the many values is assigned the highest priority in a given decision (Kraft and Furlong, 2006).

Agents that promote and participate in science and technology communication processes, should strive to build policies (strategies) to be implemented by government agencies, educational–scientific institutions, media, civil society organizations, and organized groups, in order to foster a better perception, a high valuation, a better understanding, and a wide appropriation of science and technology by all segments of society.

A case of development of science communication public policies in Mexico

The State of Michoacán, a Mexican province or department with about 4 million inhabitants, with large backlogs in education, technological development and competitiveness has undertaken in the past seven years, significant efforts in the field of public communication of science and technology, as a strategy to improve school education and teacher performance, as well as scientific culture of the whole state population.

In this context, the State Council for Science, Technology and Innovation of Michoacán, with the support from a group of experts in science popularization

management, developed between 2009 and 2010 the State Program of Diffusion and Popularization of Science and Technology (PEDDCyT). Michoacán thus became the first Mexican state in having a statewide instrument to guide, focus, articulate and enhance public communication of science and technology on solid basis of diagnostic and participative planning.

The Michoacán State Program of Diffusion and Popularization of Science and Technology (PEDDCyT) is comprised of three components:

- (1) A **systemic diagnosis of the situation of science-technology popularization** in the State, from primary and secondary sources of information. This diagnosis included an analysis of the relevant environment in which S&T popularization occurs in Michoacán, comprised by an evaluation of the state formal educational system, an analysis of science-technology sector, and an assessment of Michoacán competitiveness and innovation potential, as well as capabilities and limitations of Michoacán to access a knowledge-based economy. The diagnosis also included an inventory of the activities and resources of popularization of science and technology in the state, an assessment of Michoacán's science communicators community strengths and weaknesses, as well as the identification of opportunities and threats faced by the S&T popularization in the state socio-cultural environment (SWOT Analysis);
- (2) The design of **public policies on S&C popularization**, along with their respective lines of action (to be eventually incorporated to the new Law of Science and Technology in the State of Michoacán);
- (3) A **Strategic Plan of Popularization of Science and Technology**, statewide and with a time horizon of three years, which included a prospective component (mission, vision, general objectives), a strategic component (SWOT analysis, strategic bet, mid-term strategic projects portfolio aimed to strengthen S&T popularization, and a tactical component (set of short-term operational programs and development projects of public communication of science and technology).

The process of formulating the Michoacán State Program of Diffusion and Popularization of Science and Technology --which included public policies as a core component-- was conducted with two features that added value to the end product. On the one hand, the process was marked by a very wide participation of the Michoacán's S&T popularization community, which generated a product of shared visions, experiences, and aspirations. On the other hand, a proprietary method involving various data collection strategies was developed from both primary and secondary sources (surveys, collective contributions in large groups, focus groups, and document analysis); diagnosis through SWOT group analysis; prospective, strategic and tactical planning techniques; and normative formulations generated by taking into account the science communicators community proposals.

Specifically, the **Public Policies on S&T Popularization** component was made up from the following inputs:

Primary sources:

The proposals made for a large group of about 200 specialists, gathered at a plenary session of a state convention of science communicators.

The results of a SWOT analysis, which was performed by a select group of experienced communicators.

Secondary sources:

The science and technology policy in Michoacán.

The results of the diagnosis and context analysis of popularization in the State of Michoacán, conducted as a part of the PEDDCyT project.

References relevant to public policies on S&T popularization, in other countries.

The strategic commitment to strengthen science communication in Michoacán, formulated from both diagnosis and prospective of S&T popularization in the state.

Figure 1 shows the sub-process applied to the formulation of public policy on science and technology in Michoacán, which was part of the overall process of developing the PEDDCyT.

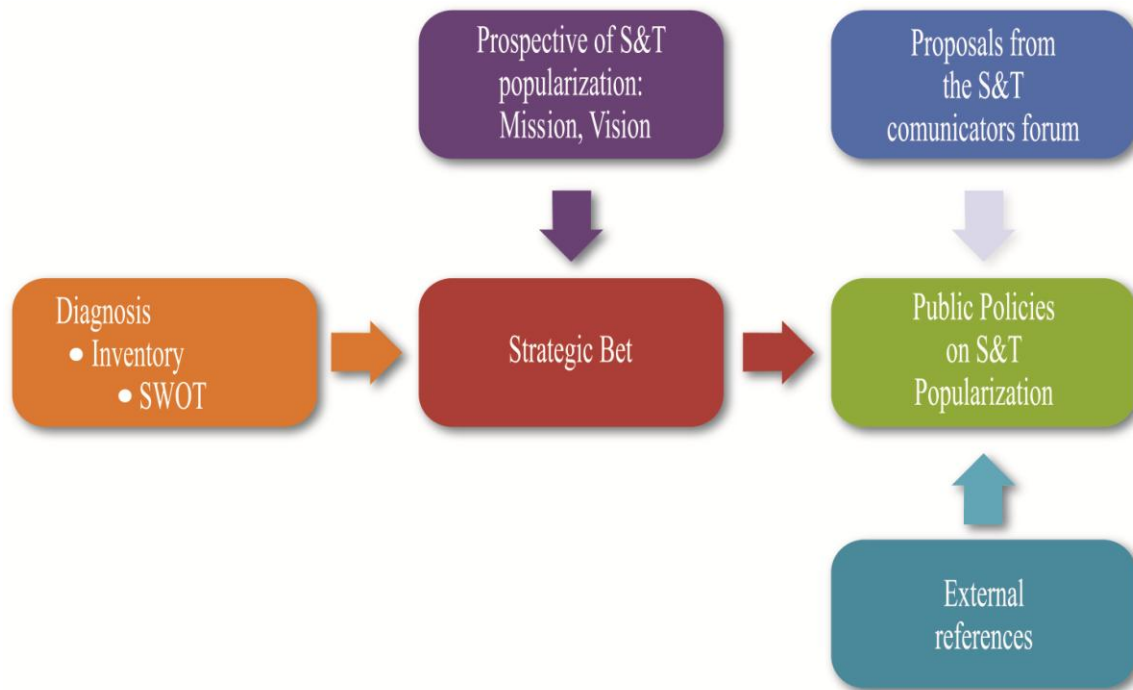


Figure 1

The end product of this systematic process was the design of three basic general policies plus eleven specific policies.

The first basic policy focused on the why and wherefore of science-technology popularization in Michoacán.

The second basic policy referred to the institutions responsible for the science and technology diffusion and popularization in the State.

The third one defined the role of the State Council of Science, Technology and Innovation as a promoter, coordinator, articulator, and active agent of the popularization of science and technology in Michoacán.

Topics of the eleven specific public policies were the following:

1. Social relevance of S&T popularization.

2. Socio-geographic coverage.
3. Promotion of public appraisal of science and technology.
4. Formal educational system support.
5. Promotion of vocations to study programs in science and technology.
6. Institutionalization of S&T popularization.
7. S&T popularization management.
8. Entailment and synergy for S&T popularization.
9. Infrastructure and resources for popularization activity.
10. Sources of funding.
11. Professionalization of S&T popularization.

Each one of these eleven policies was duly defined and described; and its application was projected in several proposed Action Lines (an average of 7.3 Action Lines per policy).

For the Michoacán State Program of Diffusion and Popularization of Science and Technology, the Public Policies were operationalized through its explicit correlation with the *Specific Strategies* which together comprised the so called Strategic Bet (component 3 of the project, Strategic Plan for Popularization of Science and Technology). In turn, those specific strategies were translated into strategic objectives, and resulted in a portfolio of operational programs and strategic projects of medium and short terms, aimed at achieving these objectives.

In total, 95 operational programs and strategic projects were proposed: 24 that were already established 22 more that also existed but required major changes, and 49 new projects. The latter, 52 % of the total, accounted for the factor of change and development for strengthen the public communication of science and technology in Michoacán.

Those 95 programs and projects were ranked according to criteria of relative importance, in terms of their costs and potential impact; and they were scheduled in a three year timetable (medium term).

By consensus of the institutions and groups involved in planning, each program or project was assigned to an institution responsible for coordinating and monitoring; other

actors involved were also defined, as well as the corresponding budgets and funding sources.

A very important factor for the implementation of public policies to strengthen the popularization of science and technology in Michoacán was the decision made by the State Executive of validating the policies through its publication, as part of the broader PEDDCyT, in the Official Gazette of the Government of the State of Michoacán.

Concluding remarks

The widely participatory formulation of Michoacán's PEDDCyT (including public policy) generated an enriched result, which was adopted by the science communicators' community. This program has provided all actors of S&T popularization in Michoacán solid basis to better focus their work in pursuit of a greater social relevance. It has also been an effective tool for growth in institutional relationships, alliances, synergy, and resource sharing.

The Michoacán PEDDCyT in general and public policy on S&T popularization in particular, are a pioneering case in Mexico, which has already been useful as a benchmark for other states. Particularly, a similar program has been formulated in the State of Guanajuato; and PEDDCyT has been used as a reference for the creation of a national program and public policy on Science Communication in Costa Rica, by initiative of that country's RedCyTec (an institutional network of science communicators).

This Mexican pioneering experience can be used as a reference for conducting similar efforts in other Latin American and Caribbean countries, in order to create relationships, synergy, and articulated work for greater advancement in effectiveness and social relevance of S&T popularization, on the basis of shared vision and joint actions with a systematic approach of those who make science communication.

References

Kraft, Michael and Furlong, Scott (2006), *Public Policy: Politics, Analysis and Alternatives*, 2nd ed. Washington, D.C., CQ Press.